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ABSTRACT

A study looked for age differences in the quality of responses to the Life Review Task (LRT), studied the LRT itself as a tool for exploring wisdom and intellectual functioning in adulthood, and considered personality characteristics and life experience as alternative predictors of response quality. Sixty-three West German women of different ages were asked to think aloud as they constructed the life review for a fictitious woman who was either young, middle aged, or old. The women were aged 25-35, 45-55, and 65-75. Verbatim transcriptions of the protocols were rated on six theorized indicators of a "wise" response: (1) good, insightful judgment and advice about difficult life problems; (2) rich knowledge about life; (3) rich knowledge about life review; (4) contextual thinking; (5) relativistic thinking; and (6) thinking that acknowledges the uncertainties of life. Twelve raters were trained to evaluate the quality of responses against an ideal "wise" person. Overall, only a small number of wise protocols (responses given a top rating on all six scales) were present in the sample. Age differences were minimal, with old subjects not rated significantly lower than middle-aged and young subjects on any of the wisdom-related scales. Old subjects were rated significantly higher than young subjects on the scale for "thinking that acknowledges the uncertainties of life." The study suggests that there is some empirical ground for the adoption of a more balanced view of aging than the one currently prevalent. (Includes 14 pages of references, 21 tables, 8 figures, and appendices in German on the life review interview, rater training, and rating tools.) (CML)

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Studien und Berichte 47

Ursula M. Staudinger

The Study of Life Review

An Approach to the Investigation of Intellectual Development Across the Life Span

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Ursula M. Staudinger

The Study of Life Review

An Approach to the Investigation of Intellectual Development Across the Life Span

Max-Planck-Institut für Bildungsforschung

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In dieser Reihe veröffentlicht das Max-Planck-Institut für Bildungsforschung, Lentzeallee 94, 1000 Berlin 33, abgeschlossene Forschungsberichte, die vorwiegend eine spezielle Thematik behandeln.
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„Die größte Energie und höchste Spannung der Geisteskräfte findet, ohne Zweifel, in der Jugend Statt, spätestens bis ins 35ste Jahr: von dem an nimmt sie, wiewohl sehr langsam, ab. Jedoch sind die späteren Jahre, selbst das Alter, nicht ohne geistige Kompensation dafür. Erfahrung und Gelehrsamkeit sind erst jetzt eigentlich reich geworden: man hat Zeit und Gelegenheit gehabt, die Dinge von allen Seiten zu betrachten und zu bedenken, hat jedes mit jedem zusammengehalten und ihre Berührungspunkte und Verbindungsglieder herausgefunden; wodurch man sie allererst jetzt so recht im Zusammenhange versteht. Alles hat sich abgeklärt. Deshalb weiß man selbst Das, was man schon in der Jugend wußte, jetzt viel gründlicher; da man zu jedem Begriffe viel mehr Belege hat: Was man in der Jugend zu wissen glaubte, Das weiß man im Alter wirklich, überdies weiß man auch wirklich viel mehr und hat eine nach allen Seiten durchdachte und dadurch ganz eigentlich zusammenhängende Erkenntniß; während in der Jugend unser Wissen stets lückenhaft und fragmentarisch ist. Nur wer alt wird, erhält eine vollständige und angemessene Vorstellung vom Leben, indem er es in seiner Ganzheit und seinem natürlichen Verlauf, besonders aber nicht bloß, wie die Übrigen, von der Eingangs-, sondern auch von der Ausgangsseite übersieht ...“

Arthur Schopenhauer
Aphorismen zur Lebensweisheit

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Abstract

Life review, involving the construction, explanation, and evaluation of life histories is proposed as an instance of intellectual functioning which theoretically could evince stability and even growth in later adulthood. The stimulus for focusing on the potential for intellectual stability and growth in old age was the current popular societal concern with the possible future implications of the growing aged population in industrialized societies. Against the background of a negative aging stereotype and a notion of disease-related aging, this demographic change, so far, has been primarily discussed in terms of the disadvantages for society.

The present study is designed within the dual process model of intellectual functioning (Baltes, 1987). The dual process model distinguishes the "mechanics" of intelligence which typically show decline in old age from the "pragmatics" of intelligence which are associated with potentials for stability and growth during adulthood. Wisdom is considered a prototype of growth in the pragmatics of life (Smith, Dixon, & Baltes, in press) and has been investigated using tasks and methods designed to expose the associated knowledge system.

The Life Review Task (LRT) introduced in the present study is proposed as a tool for exploring wisdom and intellectual functioning in adulthood. Three life review problems referring to different target-review ages (young, middle-aged, old) were developed to elicit knowledge about the entire spectrum of adult life.

Three major questions were examined. The first and most important question concerned possible age differences in the quality of responses to the Life Review Task. The LRT and the approach to investigate intellectual functioning in adulthood is still quite new, therefore a second set of questions concerned performance factors related to the Life Review Task. Finally, a number of possible alternative predictors of response quality (personality characteristics, life experience) were explored.

Females ($N = 63$) of different ages (25–35 years, $M = 31$; 45–55 years, $M = 49$; 65–75 years, $M = 69$) were asked to think aloud as they constructed the life review for a fictitious woman who was either young, middle-aged or old. Verbatim transcriptions of the protocols were rated on six theorized indicators of a "wise" response: (a) good, insightful judgement and advice about difficult life problems; (b) rich knowledge about life; (c) rich knowledge about life review; (d) contextualistic thinking; (e) relativistic thinking; (f) thinking that acknowledges the uncertainties of life. Twelve raters (two per dimension) were trained to evaluate the quality of responses against an ideal "wise" response.

Overall only a small number of "wise" protocols (i.e., responses given a top rating on all six scales) were present in the sample. Age differences concerning the whole range of performance on the LRT were minimal: Old subjects were not rated signifi-

cantly lower than middle-aged and young subjects on any of the wisdom-related scales. For one scale, "thinking that acknowledges the uncertainties of life," old subjects, however, were rated significantly higher than young subjects. For the scale "good life review" and "contextualistic thinking" subjects were rated highest for the life review problem closest to their own age. The exploration of the relationship between personality and life experience measures to response quality revealed that chronological age in itself may not be the only predictor of knowledge and skill in the domain "fundamental pragmatics of life."

In relation to performance factors, young subjects indicated their use of primarily impersonal knowledge sources compared to old subjects' primary reference to personal experiences when responding to the LRT. This perhaps reflects cohort-specific increases in generally available knowledge about human behavior and life-span development. Subject-age groups did not differ in self-perceived task difficulty and familiarity with life review which was interpreted as an indicator of ecological validity of the LRT for all three age groups. Furthermore, some evidence was found that the LRT seems to tap into additional aspects of intellectual functioning beyond those assessed by extant measures of psychometric intelligence. With regard to the match between subject and target-review age, life review problems with the largest difference between subject and target-review age were found to be overall rated lower than the other kinds of life review.

In concert, the present study suggests that there is some empirical ground for the adoption of a more balanced view on aging than currently prevalent in our society. Knowledge about fundamental life pragmatics seems to be an area of intellectual functioning that holds the potential for stability and even select growth across the life span. Life review is proposed as a procedure that, on the one hand, may further the development of an individual's knowledge about life. On the other hand, the products of individuals' life review processes may also be employed as a resource by society (e.g., as an aspect of intergenerational transfer of knowledge). Further research is suggested to identify the critical conditions fostering growth of knowledge about life matters.

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Chapter 1
Introduction

Purpose of the Study

In the social sciences the recent decade has witnessed the emergence of a new conceptualization of the nature of human aging associated with a life-span view of human development. This conceptualization is especially evident in psychology (e.g., Baltes, 1987; Honzig, 1984; Thomae, 1978) and sociology (e.g., Featherman, 1983; Kohli, 1985; Pifer & Bronte, 1986). One of the recurring central questions is the search for positive aspects of growing old. Does growing older necessarily and exclusively imply loss: loss of strength, loss of intellectual capacity, loss of physical attractiveness? The main assumption underlying this investigation is that besides processes of decline, development in later adulthood is also characterized by processes of growth and stability. This assumption is juxtaposed to the negative aging stereotype still prevailing in most developed countries and the belief that a growing aged population is a major liability in terms of socio-economic growth of a society.

The present study aims at throwing doubt upon the exclusively negative aging stereotype and at providing some evidence for a more balanced view on aging. On an individual level, this doubt is meant to break through the vicious circle of self-fulfilling prophecies and encourage belief in the possible positive aspects of later adulthood. On a societal level, this doubt is meant to widen the perspective from focusing on the liabilities to also considering potential assets associated with a greying society.

The content domain of intellectual functioning was selected as a sample case to accomplish this goal. A paradox is characterizing theory and research in the field of intellectual aging. How should one deal with the following contradictive evidences? On the one hand, healthy older adults are well able to successfully manage their lives. Furthermore, numerous individuals have made important contributions to society at very old ages, like for example Piaget, Freud, Michelangelo, Picasso, or Frank Lloyd Wright. Simonton (1983) provided an extensive analysis of genius, creativity, and leadership throughout the life span. According to his results, the proportion of top-quality products varies across individuals, but stays relatively constant within one career. Although there might be decline in quantity of products, the quality of cognitive products remains stable or might even increase throughout one's life.

Returning to the paradox, there is, on the other hand, empirical evidence suggesting age-related decline in intellectual functioning. Does such evidence, however, allow us to infer that older adults are less intelligent than younger adults? Provided that intelligence is conceptualized as the ability to adapt to as well as to shape and select the environment, this conclusion would be wrong (Baltes, Dittmann-Kohli, & Dixon, 1984; Sternberg, 1985a). Rather, this definition of intellectual functioning suggests a closer look at the environment older adults live in. The environmental demands and life tasks older adults have to deal with, such as decrease in number of societal roles, death of loved ones, and the life goals older adults strive for, differ substantially from those of younger individuals (e.g., Havighurst, 1972; Kahana, 1982; Schaie, 1977). Consequently, the intellectual abilities enabling older adults to cope with such demands will differ from those of young adults.

A suggested solution to the paradox is the postulation of a dynamic interplay between growth, stability, and decline characterizing development in intellectual functioning across the life span (Baltes, 1987). The empirical work conducted within the present study focuses on stability and growth. It is assumed that processes of stability and growth may be, for example, associated with knowledge about life, its development and variations. Access to individuals' knowledge about this domain is gained via a Life Review Task.

General Background of the Study

As an introduction to the present study, I would like to start out by taking a rather wide-angled perspective. Imagine a system of interlocking frames. First, I will describe the outer all-encompassing frame, and then proceed inward. The outer frame considers the implications of a greying society from an interdisciplinary perspective, in particular, combining insights from demography, biology, and sociology.[1] The middle frame, discussed thereafter, will point to some observations from the sociology and history of science with regard to psychological research on aging. It will also sketch the research program of a life-span psychology of aging and old age. Finally, rounding off the introduction, the inner frame will describe the research agenda of the present study.

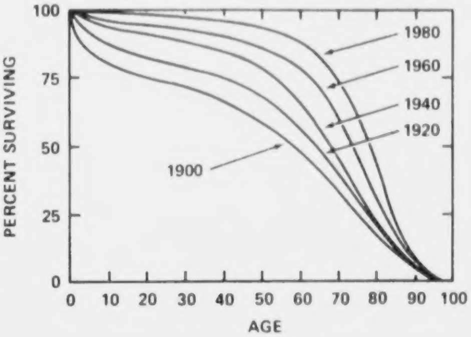
The Emergence of a Greying Society

Scientists in the socio-medical field have identified what is called "the rectangualization of the survival curve" (e.g., Comfort, 1979; Franke, 1985; Fries & Crapo, 1981; Rosenwaike & Dolinsky, 1987). As an example, Figure 1 illustrates this phenomenon for the population of the United States (see below; cited from Fries & Crapo, 1981, p. 7). In this figure, the cumulative survival (percentage of the population remaining alive) is plotted on the vertical axis and year of age at death on the horizontal axis. When comparing the five curves, it becomes clear that the number of people staying alive until a higher age has increased considerably during the last 80 years. For example, given the level of mortality in the year 1900 half of the population had died before reaching the 60th birthday. In 1980 the chances for a 60-year-old to live longer

---

[1] Multidisciplinarity is a general characteristic of the field of gerontology. As Birren (1959) claimed, biological, psychological, and social phenomena are increasingly correlated towards the end of life. The multidisciplinary approach is also evident in the joining together of various disciplines within gerontological societies.

Figure 1: Human Survival Curves for 1900, 1920, 1940, 1960, and 1980



Note. These curves are correct. They converge at the same maximum age, thereby demonstrating that the maximum age of survival has been fixed over this period of observation. (National Bureau of Health Statistics.) Cited from Fries and Crapo (1981).

had climbed to approximately 90 or 95%. At the same time, the maximal human life span is not extended. What has happened instead, is a "compression of mortality" to the last years in life (Fries, 1980).

Together with this modification in the survival curve, the kind of sicknesses confronting the population have changed. Acute, infectious diseases (such as typhoid, tuberculosis, pneumonia) have become rare in developed countries since the beginning of this century. Chronic diseases, such as diabetes, cancer, artherosclerosis, or cirrhosis have gained importance (Fries & Crapo, 1981). Further, with more and more people reaching higher ages, the incidence of "new" illnesses was increased. One example of this phenomenon (in the realm of cognitive functioning) is Alzheimer's disease (senile dementia).[2]

Parallel to the increasing number of older people in the population, a decrease in the birthrate has been observed in industrialized nations, since the turn of the century. These two separate and simultaneous developments account for the rapid pace at which industrialized societies are greying. Figure 2 (see below; cited from Franke, 1985, p. 8) portrays this phenomenon for the Federal Republic of Germany. Within developed countries, the demographic changes have been especially extreme in Germany: They even resulted in negative population growth. The ratio of number of over 65-year-olds to number of under 15-year-olds has changed from 1:7 in 1890 to 1:1 in

---

[2] In the population of the over 65-year-olds it has a prevalence of 5%, within the group of over 75-year-olds the percentage rises to 47% (Kay & Bergmann, 1980). With more and more people living into this age, dealing with Alzheimer's disease will be one of the major challenges for scientists working together in the field of gerontology. It should be noted that Alzheimer's is considered a disease, and not a characteristic of disease-free aging. A discussion of the distinction between disease-free and disease-related aging will follow.

1980 (Franke, 1985). According to demographic prognoses, this trend will be progressive. In the year 2030, 16.6% of the German population is predicted to be under 20 years of age and 37% to be over 60 years of age (Statistisches Bundesamt, 1985).

Figure 2: Historical Development of German Demographic Structure

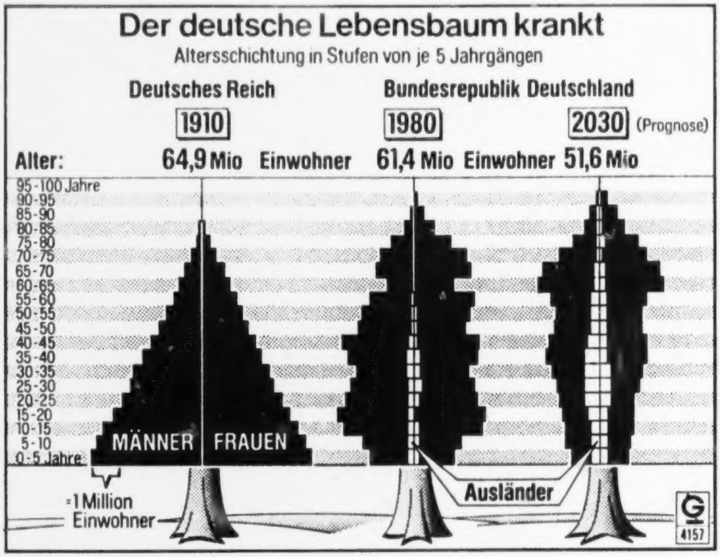


Abb. 1–8. (Globus-Kartendienst, Hamburg.)

Note. Cited from Franke (1985).

Societal Implications of a Greying Society

The socio-economic and humanitarian consequences of this historical change in the demographic structure of industrialized nations are widely discussed as major problems threatening the future vitality of these societies (e.g., United Nations, 1985). The central socio-economic implication, for example, is a "deteriorating" ratio between the labor force and aging dependents. Given that activity rates among the older population will continue to decline, the growing old-age dependency ratio will outweigh the decrease in young dependents and will demand an increasingly larger share of the national budget resources (pension, social services, tax revenues etc.). This scenario, however, represents only one side of the coin. It is based on the assumption that older people, by virtue of being old, are less capable and probably not willing to work on into their later years. Furthermore, this projective calculation also includes high estimates for health care costs because of large numbers of ailing and disabled older persons.

This somewhat pessimistic view is mainly informed by and associated with a negative societal aging stereotype as well as a notion of aging that confounds disease-related and disease-free aging. Both of these topics will be discussed in more detail in the following paragraphs, before we then move on to have a closer look at the other side of the coin involving the potential positive implications of a greying society.

The Negative Aging Stereotype

A stereotype is defined to be a fixed set of attributes imposed by an observer on *all* members of a given group (Harré & Lamb, 1983, p. 614). The negative aging stereotype can be outlined by the following main descriptors (e.g., Butler, 1974; Lutsky, 1980):

- Unproductiveness: Older people have lost their creativity and ability to contribute to society.
- Disengagement from life: Older people are withdrawn into themselves—if at all, they only socialize with peers.
- Inflexibility: Older people have lost their ability to change and to adapt.
- Senility: Older people show forgetfulness, confusional episodes and reduced attention. Senility, in fact, is a quite common term to denote the behavior of the old.
- Physical ailment: Older people are physically weak, their bodies shrink and they are stricken by diseases.

In sum, older people are perceived to be feeble, uninteresting, they await their death, and are a burden to society, their families, and to themselves. Butler (1969) called the process of systematic stereotyping and discrimination against people because they are old "ageism."

Evidence for the existence and the historical development of the negative aging stereotype has been gathered in numerous society-level-studies (McTavish, 1971) concerning the generalized image of old age (for review see, e.g., Achenbaum, 1985; Lehr, 1984).[3] In primitive societies, old age reportedly had and still has a high status. Towards the end of the Roman Empire and the dawning of the Middle Ages youth advanced to the leading positions in society, older people were almost excluded from public life (de Beauvoir, 1972; Borscheid, 1987). In her interpretation, de Beauvoir closely ties the domination of youth with the advancement of christianity. Towards the end of the Middle Ages, related to the rise of trade and economy which does not ask for physical rigor but for financial power, old age regained societal influence—only, however, to loose it again with the growing industrialization at the beginning of the 20th century.

The quite capricious fate of the image of old age throughout human history illustrates quite impressively the influence of society and culture on the status of old age within human communities. Thus, it is underscored that the above described image of older people is quite rightfully labelled a stereotype, rather than the description of a biologically determined human fate (Riley & Bond, 1983). This is not to say that the negative image of old age outlined above is not a valid one for a number of individuals. Although in our society it is quite unlikely to happen, precautions should be taken that the pendulum does not swing too far in the other direction, and produce a positive stereotype (Butler, 1974). A positive aging stereotype may include descriptors such as all old people are wise, are still mentally active, and are physically well and fit. Again, the generality of this description of old age would make it a stereotype. Rosenmayr (1987a), for example, described the tyranny of old age within some African tribes where the seniority principle is applied irrespective of the old individual's mental and physical condition. The goal should be to gain a more realistic view of old age as well as to gain knowledge about how to optimize the aging process.

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[3] Recently, mostly individual-level-studies, have raised doubts about the existence of a negative aging stereotype (see Wingard & Dorman, 1983). The discrepancy between studies is mainly discussed in relation to methodological issues of attitude research.

Taking a more global perspective and overwriting the ups and downs described in the historical outline above, two main issues can probably be identified as underlying the overall loss in status of older people. First, the proportion of old people in modern societies is higher compared to the one in primitive societies. In primitive societies an old person always has been something rare and precious (Rosenmayr, 1983). Under such conditions, becoming old has been a virtue in itself (de Beauvoir, 1972). Second, within primitive societies, old age has taken over valuable functions, such as educating the young, being the storeholder of accumulated knowledge, of knowledge crucial for survival (Tartler, 1961). In fast-changing modern societies, however, those functions are thought to be equally well performed by the media and by computers. The process of devaluation of old age in modern societies runs parallel to the attribution of an increasingly higher value to youth, permanent progression, and innovation. Old age, stigmatized as rigid, conservative, and oriented towards the past, can only be an obstacle to reaching such goals.

Limited opportunities for most old people and a wide disregard of older people's abilities within modern societies up to now are but one effect of the negative aging stereotype (e.g., Achenbaum, 1985). In addition, the prevailing negative aging stereotype can become a self-fulfilling prophecy for the individual (e.g., Lehr & Schneider, 1984; Riley & Bond, 1983). Being presented with this negative stereotype during socialization makes one expect certain limits of functioning after middle adulthood (e.g., Heckhausen, Dixon, & Baltes, 1988). As a consequence, the range of behaviors one expects to be capable to engage in is limited. This confinement to certain activities (performances) may, in the long run, result in an actual decrease of competencies.

Disease-Related and Disease-Free Aging

A second issue contributing to an overly negative and pessimistic interpretation of the consequences of a greying society concerns responsibilities for health care. It is assumed that society may have to finance for its citizens a long period of chronic disease in old age. The key question here is whether it is possible to separate "disease-free" from "disease-related" processes of aging. Gerontologists discuss this issue by distinguishing between primary (normal, disease-free, endogenous) and secondary (disease-related, exogenous) aging (e.g., Birren & Cunningham, 1985). It should be noted that the developmental marker "chronological age" represents a combination of both processes.[4]

What does bio-medical research tell us about the possibility to separate primary from secondary aging? The effectiveness of the neural system to time regulatory functions is suggested as one of the undeniable markers of aging (Birren & Cunningham, 1985, p. 12). Aspects of aging, like cardiac reserve, dental decay, glucose tolerance, physical strength and endurance, reaction time, or systolic blood pressure have, however, proved to be modifiable. Attempts of modification have so far not been successful for a number of other aspects of aging, such as arterial wall rigidity, cataract formation, kidney reserve, greying and thinning of hair, and elasticity of skin. Still, these so far non-modifiable variables show great variability in the population. People seem to age at different rates. Differences between individuals become greater as they grow older. Fries and Crapo (1981) claimed that by excluding chronically ill people from the sample, the decline in functioning on biological and physiological markers with chronological age would be considerably reduced.

In conclusion, such findings suggest that the reportedly increasing probability of chronic disease with increasing chronological age can be accounted for by primarily exogenous factors. Thus, the central importance of chronological age for processes of aging is strongly called into question. Riley and Bond (1983) talk about a century-long lag between the "postponement of death" and the "postponement of disability": "... today's protracted stage of old age disability will appear as a historical aberration ... not as a result of natural law." (p. 247)

Medical research has identified a number of risk factors fostering chronic disease, such as lack of exercise, cigarette smoking, excessive alcohol consumption, obesity, or psychological coping mechanisms with stress (e.g., Rowe & Kahn, 1987). It has been suggested that the selection of a certain life style together with a supportive environment (social network, living conditions, social roles; Butler, 1974) may help to "compress morbidity" to the last years of life, and prolong the phase of vitality (Fries, 1980). This does not refute the fact that there is a biologically-set life span. It is unlikely, however, that—without gen-technological interventions—the biologically-determined human life span can be prolonged.

The Other Side of the Coin

The considerations concerning primary and secondary aging have already started to turn the coin. The turn is completed by claiming that it is in fact possible to separate primary from secondary aging[5] and that the above described negative image of aging only represents one aspect and not the complete phenomenon. As early as 1939, Dewey described the separation of age from maturity. He pointed to a cynicism of human history. Dewey proposed that in earlier times one thought that if one could just live longer, one would gain wisdom. Now, as one grows older, older people are considered dysfunctional for society. Dewey (1939) cautioned against this societal belief:

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[4] A third aspect of the aging process can be delineated from the literature which is referred to as tertiary aging. Tertiary aging is associated with the terminal decline starting months or years before death (Kleemeier, 1962). It results in losses not only concerning age-sensitive variables but also concerning variables which are usually considered age-insensitive.

[5] This assumption is implicit in most of the psychological research on aging. Subjects are usually selected for their health status.

> "That there should be a gradual wearing down of energies, physical and mental, in the old age period it is reasonable to expect on biological grounds. That maturing changes, at some particular age, into incapacity for continued growth in every direction is a very different proposition." (p. XXV)

Once chronic disease and decline is not accepted as human fate, individuals and society have the opportunity to actively invest in their vitality. From a review of historical and concurrent research evidence, Viefhues (1987) concluded:

> "The majority of old people today are far more vital and healthy than in the past. Increasing longevity, persisting vitality in old age, ..., is a cultural process of a comprehensive nature and shows the historicity of the human body." (p. 168)

The individual is one component in this cultural process. According to medical research (see above), a person can influence his/her vitality by adhering to a certain life style. Claiming the malleability of the process of aging opens a wide field for psychological research on successful aging (e.g., M. Baltes, 1987; Lehr, 1985).

On behalf of society, varying political measures can be taken. Indeed, in some societies legislation, acknowledging the existence and detrimental social effects of the negative aging stereotype, has considered it necessary to protect the aged. An Age Discrimination and Employment Act was passed in the United States in 1967 which, among other things, ended mandatory retirement. In the Federal Republic of Germany a social welfare act passed in 1961 especially addressed the living conditions of old people, covering issues related to social isolation or financial disadvantage.

Lately, aging has also become a topic for the United Nations. In 1982, a World Assembly on Aging was held which proposed an International Plan of Action on Aging (United Nations, 1983). In a volume on the World Aging Situation (United Nations, 1985) the potentially negative, as well as the possibly positive effects of the growing number of older people are discussed.

> "Juxtaposed to those negative effects is the potential for the aging of populations to become a positive factor in economic development. Increased longevity in combination with improved health imply that the growing older segment of the population could constitute an important human resource for development, if policies aimed at exploiting its skills and resources are implemented. By promoting the participation of the aging in productive activities, the burden of high levels of aging dependency could be transformed into an impetus for economic growth." (p. 44)

The suggestion to consider the aged as a resource for society has been further elaborated, for example, by demanding the investigation of the "life-cycle pattern of human capital acquisition" (United Nations, 1985, p. 59). As job requirements in developed countries have become less physically demanding and older workers have acquired experience throughout their working lives, they are often found to be as productive as younger workers. Thus, the UN report proposed a revision of working opportunities for older people and suggested the reconsideration of lowering retirement ages in times of higher unemployment. Other suggestions centered around training and education *of* the aged as well as *by* the aged and the strengthening of participation in all facets of community life (such as taking over domestic responsibilities or participation in community policies).

Psychology and the Greying of Society

In our journey through the system of interlocking frames, we have now reached the middle frame. In order to continue, we will take the perspective of a sociologist and a historian of science and have a somewhat critical look at the development of psychological research in the field of development and aging. The question we ask refers to whether and how historical change in demographic structures and in status of old age is reflected in psychological research.

Emphasis on Childhood and on the Negative Aspects of Aging

In psychology, the long prevailing large proportion of young people in the population finds its reflection in the long predominant emphasis on childhood and adolescence within developmental research (e.g., Baltes, 1983; Bollnow, 1962; Dixon, Kramer, & Baltes, 1985). Some of the considerations underlying this emphasis might have been, for example, that since children are the asset of a society, youth has to be furthered and supported, and the conditions of socialization have to be optimized.

An interesting incident, reported by Rosenmayr (1983, p. 100), illustrates the postulated predominance of research on childhood and adolescence. As early as the turn of the century G. S. Hall published a book on adolescence (Hall, 1904). As Hall progressed in his own life course, he later wrote a book on senescence. This book, published in 1922, was the first major monograph on aging written by a social scientist. According to Rosenmayr, Hall's volume on adolescence instigated research in the field of adolescence even before the first world war. Hall's volume on aging, however, did not generate an equally quick response. Research on aging on a large scale did not start before the fifties (Rosenmayr, 1983).

The Gerontological Society of America, for example, was founded in 1945. In the fifties a number of international gerontological congresses took place and in 1967 the German Gerontological Society was established (Lehr, 1986). Two additional dates make the recency of increasing research interest in the field of aging even clearer. Both the National Institute of Aging in the United States and the German Center for Questions on Aging were founded as recently as 1974.[6]

Whether the formation of the negative aging stereotype has been informed—among others—by psychological research and theory stressing decline or whether psychological research hypotheses and theoretical conceptualizations have been predominantly influenced by the negative aging stereotype is a question almost impossible to answer. As is true in many cases, the two processes were no doubt intertwined. Counterparts to the negative aging stereotype in psychological research, however, can easily be identified, such as, for example, models of development, and more specifically theories referring to cognitive development, equating aging and decline (e.g., Wechsler, 1944; Yerkes, 1921). Empirical evidence concerning intellectual development throughout the life span will be presented in detail in the next chapter. An example from social psychology is the disengagement theory (Bromley, 1970; Cumming & Henry, 1961) that postulates that a high degree of well-being and life-satisfaction in old age is related to withdrawal from social roles and contacts.

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[6] Meanwhile the National Institute of Aging in the United States has an annual research budget of approximately $ 150.000.000. This money constitutes about 1/3 of the annual budget of the German Research Association (DFG) in the Federal Republic of Germany covering all areas of research.

Increasing Interest in Old Age and Positive Aspects of Aging

With the changing shape of the population pyramid, that is the increase in the proportion of old people and the decrease in young people, research efforts in the field of aging have been intensified and the attention given to possible positive aspects of aging has increased. On the one hand, as described above, society has a vital interest in finding solutions to the more and more pressing problems of rising medical-care costs and of shrinking retirement funds, etc. (Pifer & Bronte, 1986). It has been and will be necessary to investigate the possible resources related to a growing older segment of the population. On the other hand, the aging individual should be able to optimize his/her life course if he/she wants to.

Gerontological research nowadays seems to be located between these two objectives (see below). I believe it is necessary to acknowledge the association between changing problems and values in society, and perspectives and paradigms in psychological research. One should be aware of possible harmful consequences of this association. In a very trenchant and amusing way Gronemeyer (1987) has described such directions in a paper given at a conference "The greying society: Social consequences of the demographic change in the Federal Republic of Germany". He asked whether "die Fähigkeit zu Altern aus den Händen von Fachleuten empfangen werden soll?" and claimed "mehr und mehr Alte lassen sich ihren Lebensabend von professionellen Gero-Händlern planen, verwalten und glätten. Curriculare Versaftung des Alters als Perspektive?" (p. 442) As overstated as this perspective is meant to be, I think it is helpful as a measure of precaution to keep such an extreme perspective in mind.

This does not imply that gerontological research is totally dependent on societal interests—a closer look at its history would falsify this assertion. In addition, it should be pointed out that rather than results, it is the interpretation of results that may be colored by societal values. Thus, against the background of societal values like efficiency and fast progression, aging processes related to reduction in speed (of thinking, of acting) are interpreted as a liability of old age. From a different perspective, however, it is possible to view such slowing as an asset of old age in terms of increasing contemplation and reflectivity.

In the same way as some examples of research reflecting the negative stereotype have been mentioned above, examples pointing to the positive aspects of aging can also be enumerated. An example taken from social psychology is the activity theory (e.g., Lemon, Bengtson, & Peterson, 1972; Tartler, 1961) that, juxtaposed to the disengagement theory, proposes the relationship between well-being in later adulthood and activity. The disengagement theory and activity theory of aging depict very neatly the Janus face of old age (Kliegl & Baltes, 1986).

Gerontological research should help to provide evidence and theory for a more balanced view of old age. Pursuing this goal implies the acknowledgment of the enormous interindividual variability in the process of aging and the differences in direction (growth, stability, decline) this process can take, depending on which aspect of aging is considered, and implies as well the recognition of the cultural embeddedness of the aging process. This describes the core of the agenda of the life-span approach to the study of aging and old age (Baltes, 1983, 1987; Baltes & Reese, 1984; Featherman, 1983; Filipp & Olbrich, 1986; Honzig, 1984; Lerner, 1984; Sherrod & Brim, 1986) which provides the theoretical framework for the present study.

The Present Study

We have worked our way through the outer frames of reference delineating the societal and scientific context of research on human aging. Now, we will narrow our perspective down to the core, the present study itself.

The present study is part of a larger research program which is derived from the general conceptual agenda of life-span developmental psychology (Baltes, 1987) and focuses on the dynamics of intellectual growth and decline throughout the life span (e.g., Baltes & Kliegl, 1986; Baltes, Dittmann-Kohli, & Dixon, 1984; Dixon & Baltes, 1986; Heckhausen, Dixon, & Baltes, 1987; Smith, Dixon, & Baltes, in press; Sowarka, 1987). Given the presented societal and scientific context, the present work chose to focus on behavioral aspects which encompass the possibility of continued growth or stability throughout the life span. It is suggested that beyond technological and social change there may be knowledge and a mode of thinking, specific to older people, that derives its strength and utility from the status of aging even in the face of a rapidly changing world and the potentially increasing biological vulnerability of aging organisms. This knowledge may concern the basic conditions of human existence and the development of life in all its conditions and variations. Such knowledge has been described within the domain "fundamental pragmatics of life" (Dittmann-Kohli & Baltes, in press; Smith et al., in press). It may be acquired as an individual moves through life, and some individuals may even gain wisdom by reaching levels of expertise in this knowledge domain. As Mergler and Goldstein (1983) concluded, most probably healthy older adults

> "are unlikely to be able to process rapidly information from a rapidly changing environment and to act with speed and accuracy; conversely, there is an increasing likelihood that the old person will use the information gained over a long lifetime in ways that enhance the prosperity of his group." (p. 87)

There are several kinds of discourse about life which possibly display knowledge about the domain "fundamental life pragmatics" such as life planning, life management, and life review. Life review has been chosen as focus of the present study. Butler (1963, 1974) and also Erikson (1959; Erikson, Erikson, & Kivnick, 1986)—in his theory about the life-span development of personality—have related life review to the accumulation of life experiences in dealing with one's own life tasks and in observing others deal with theirs.

The emphasis of the present study on growth in intellectual functioning over the life span is informed by three further lines of inquiry. One line of inquiry refers to the research on implicit theories about wisdom (Clayton & Birren, 1980; Holliday &

Chandler, 1986; Sternberg, 1985b). The second is based on a cognitive developmental and structural tradition searching for new forms of adult reasoning (Commons, Richards, & Armons, 1984; Labouvie-Vief, 1982; Meacham, 1983). And thirdly, the present study draws on research in the field of cognitive science such as the shift from power-based to knowledge-based systems (e. g., Minsky, 1975; Newell & Simon, 1972) and the concept of expertise (e. g., Chi, Glaser, & Rees, 1982; Salthouse, 1985).

Within this frame of reference, life review, in the present study, was primarily investigated from a cognitive-psychological and life-span perspective. To this end, and following Butler's (1963) classical article on the topic, life review has been conceptualized as a two-fold procedure. It includes both the selection and reconstruction of life events as well as the interpretation and evaluation of these reconstructed events. Life review, in this sense, is neither a synonym for reminiscence (e. g., Liebermann & Falk, 1971; Molinari & Reichlin, 1985) nor is it understood as a type of reminiscence (e. g., Coleman, 1974, 1986; LoGerfo, 1981).

Within the present study life review can be considered from several viewpoints:

1. As a procedure involving the selection and reconstruction of life events, and the further interpretation and evaluation of the reconstructed events. This procedure may well change over the life course in terms of function, frequency, and style. Individuals at different ages may differ in their knowledge about the procedural components, the application, and the heuristics of life review;
2. As a product representing a sample of a person's accumulated knowledge about himself/herself and about life in general. At different ages the content, extension (breadth) and organization (depth) of this knowledge may differ;
3. As a vehicle for gaining access to the knowledge system associated with the domain "fundamental pragmatics of life." By engaging in life review, knowledge about fundamental life pragmatics may be applied as well as gained.

The present study focused on the third perspective. The work to be presented was neither particularly interested exclusively in the procedural aspects of life review nor was only the content of the produced life review the focus of inquiry. Rather, the major question of this research was whether interindividual age differences in terms of the quality of knowledge (expert-like to novice-like) in the domain "fundamental pragmatics of life" would be exposed in responses to a Life Review Task and whether some instances of expert-like (wise) performance would be observed. The following main question guided the selection of measures and the development of evaluation categories: Do healthy older individuals show more knowledge in the domain "fundamental pragmatics of life" than younger adults? Besides chronological age it is assumed, however, that personality and cognitive characteristics, as well as the extent and quality of an individual's life experiences, contribute to or are correlates of the development of that knowledge system.

Summary

In this introduction, I have tried to set up several points of reference instigating this study. Proceeding from the socio-cultural frame and continuing with some discussion of the relation between psychological aging research and the socio-cultural context it is embedded in, I derived a research agenda of the present study. For the present work the sample case of intellectual functioning has been selected to look at growth and decline in development through the adult years. Thus, Chapter 2 will give an overview of various developmental models and empirical evidence concerning intellectual functioning in adulthood before describing more specifically the theoretical model underlying the present study. Chapter 3 will focus on life review, surveying theoretical and empirical proposals concerning the timing, function, and components of life review.

Chapter 2

Decline, Stability, and Growth of Intellectual Functioning in Later Adulthood: Theory and Empirical Evidence

As outlined in the introduction, the general aim of the present work is to call the one-sided negative aging stereotype into question and to contribute to the evolution and dissemination of a more balanced view on aging. A prominent part of the negative aging stereotype is the association between old age and decline in intellectual functioning.[1] The most conspicuous symbol of this stereotype is to equate old age with senility, decreasing cognitive flexibility, and reduced speed of functioning. There is, in fact, empirical evidence supporting this view of intellectual aging. However, this evidence represents only one side of the "intellectual aging" coin. There also are studies providing evidence for age-related stability and growth in intellectual functioning.

Two groups of scholars can be identified that emphasize in their inquiries either primarily the decline aspects (e.g., Botwinick, 1977; Craik, 1977; Denney, 1982; Hooper, Fitzgerald, & Papalia, 1971; Horn & Cattell, 1967; Horn, 1982; Poon, 1985; Salthouse, 1982) or the stability and growth aspects (e.g., Baltes & Schaie, 1974; Baltes et al., 1984; Berg & Sternberg, 1985; Labouvie-Vief, 1982, 1985; Lehr & Thomae, 1987; Perlmutter, 1987; Schaie, 1979) of intellectual aging. The present study is cast within the latter research tradition. More specifically, the present work is based on a dual-process model of intellectual development in adulthood that attends to the continuous dynamics between decline, stability, and growth (Baltes et al., 1984).

Theories and empirical evidence referring to both sides of the "intellectual aging" coin (decline and stability/growth) will be reviewed in the following chapter. The review is intended to pave the way for the presentation of the dual-process model of intellectual functioning in adulthood and old age and to provide some of the background for the particular method employed in the present study. Considering the vast body of literature in this field (for reviews see e.g., Botwinick, 1984; Denney, 1982;

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[1] The term "intellectual functioning" instead of "intelligence" or "cognition" was chosen for several reasons. First, the notion of intelligence is very much associated with prevailing psychometric tests of intelligence. Intelligence quite often is operationally defined by the IQ score of an intelligence test. The research focus of the present work, however, is not on such tests therefore, it was decided not to use the term "intelligence." Second, the term "cognition" was ruled out because it usually is associated with a wider range of mental phenomena than covered in the present study. Furthermore, the notion of cognition moves the information processing approach into focus.

In sum, the selection of the term "intellectual functioning" implies that the study does not intend to cover the whole array of human mental activities, does not exclusively take an information processing approach, and that the study is not confined to psychometric intelligence. Finally, the term "functioning" points to the neo-functionalist approach to intelligence underlying the present work (Dittmann-Kohli & Baltes, in press). Intellectual functioning is located within an action-in-context perspective and is defined in terms of the ability to adapt to as well as to shape and select the environment (Aebli, 1980; Baltes et al., 1984; Sternberg, 1985a).

Dixon et al., 1985; Keating & MacLean, 1988; Labouvie-Vief, 1985; Perlmutter, 1987; Rybash, Hoyer, & Rodin, 1986; Salthouse, 1985; Sternberg, 1985c; Willis & Baltes, 1980; Woodruff, 1983), the present review is selective with its focus on stability and growth rather than decline aspects of intellectual aging.

Converging Evidence for Decline in Adult Intellectual Functioning

Many reviews of the development of intellectual functioning in adulthood start out by describing this field of the study of aging as being characterized by heated controversy (e.g., Botwinick, 1984; Denney, 1982, 1984; Dixon & Baltes, 1986; Labouvie-Vief, 1985; Salthouse, 1985). Is there decline with age or is intellectual functioning maintained until at least the sixties? Is intellectual aging a universal process of gradual decline or is there opportunity at least for some advances in select areas of intellectual functioning? A lively illustration of the ongoing battle is the debate between Baltes and Schaie (1976; Schaie & Baltes, 1977) on the one side and Horn and Donaldson (1976, 1977) on the other.

To begin, examples of empirical evidence are presented which are primarily interpreted as painting a picture of decline. All three major approaches to the study of intelligence, the psychometric, the information processing, and the Piagetian approach contribute to this picture of decline. Together with the empirical evidence, a rough outline of each paradigm is provided serving as background for the present discussion concerning the development of intellectual functioning in adulthood and into old age.

Psychometric Approach

The psychometric approach can be characterized as the historical cradle of larger-scale research on intelligence (e.g., Binet, 1909; Terman, 1917).[2] Binet's primary interest was geared towards assessing intelligence in children in order to be able to purposefully intervene and enhance intellectual abilities. The extensive application of intelligence tests in the Armed Forces before World War I (Yerkes, 1921), marks a shift in the social function of intelligence measures from educational intervention to selection. Psychometric measures of intelligence thus were designed for the major purpose of diagnosis and selection (originally of children; Keating, 1984).

The first standardization of the Binet test for the United States identified the summit of intellectual development at age 16 (Terman, 1916). Also the adaption and application of intelligence tests to World War I recruits resulted in a picture of steep decline in intelligence after the age of 20 (Miles & Miles, 1932; Yerkes, 1921). In 1955, Wechsler reported from his studies with the Wechsler Adult Intelligence Scales (WAIS) that maximal intellectual performance was reached between 18 and 25 years of age and progressively declined thereafter. Two review articles of the late fifties concerning intellectual development across the life span still draw the major conclusion that intelligence declines after early adulthood (Jones, 1959; Riegel, 1958).

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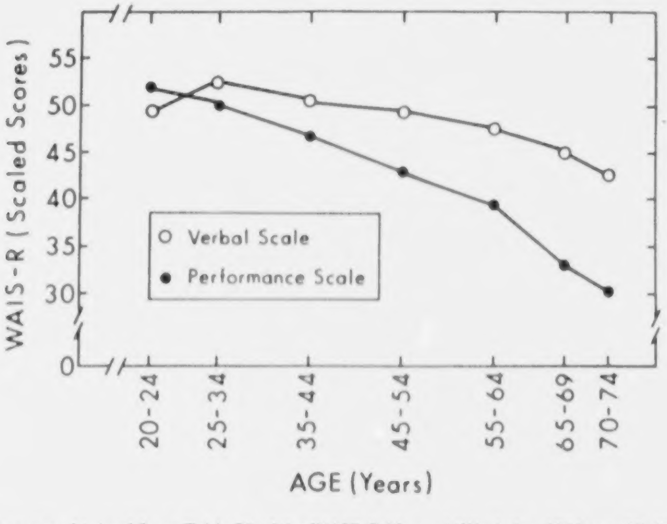
[2] This does not imply that scientists have not thought and inquired about intelligence before, for example, Binet. As described by Dixon et al. (1985), Esquirol (1838) is often identified as the initiator of mental testing. The term "mental test" supposedly first appeared in an article by James McKeen Cattell (1890).

The unitary picture of decline, however, became more *differentiated* by what Botwinick (1984, p. 254) has called the "classic aging pattern." Figure 3 (see below) illustrates this phenomenon. The notion "classic aging pattern" refers to steeper decline on the performance scale of the WAIS and almost stability on the verbal scale (Doppelt & Wallace, 1955; see also Botwinick, 1984). In 1933, a study by Jones and Conrad demonstrated such a differentiated aging pattern. A similar pattern was found in studies (Schaie, 1958) with the Primary Mental Ability Test (PMA; Thurstone, 1938). Word fluency and number showed some decline (less than a standard deviation) only after age 60. Horn (1970) enumerated 20 studies providing evidence for age-related decline in fluid abilities and stability and sometimes even growth in crystallized abilities (see also Horn & Cattell, 1967; Horn, 1982).

The identification of components of the construct "intelligence" is also reflected in psychometric theories concerning the factor analytic structure of intelligence. The major competing theories were those of Spearman (1927), Thurstone (1938), Guilford (1967), and Cattell (1971). Although these theories varied in terms of the number of intelligence factors they specified, all of them provided an empirical basis for the

Figure 3: WAIS-R Verbal and Performance Scores as a Function of Age



Note. Data were obtained from Table 20 of the WAIS-R Manual (Wechsler, 1981, pp. 97–109) by culling sum of scaled scores of IQs of 100. (The Verbal scaled scores were multiplied by 5/6 to develop a common base with the Performance scaled scores.) Cited from Botwinick (1984).

multidimensionality of the construct "intelligence" (see also Cunningham, 1980; Reinert, 1970; Schaie, 1979).

The theory of fluid and crystallized intelligence by Cattell has been of central importance for the growth versus decline controversy in adult intellectual functioning. Cattell's original definition of both "intelligences" is cited below (Cattell, 1971). We will come back to this definition when the dual-process model of adult intelligence is discussed at the end of this chapter.

> "Crystallized ability expressions operate in areas where the judgments have been taught systematically or experienced before. The differences between the words ... 'definite' and 'definitive' in a synonyms test, or in a mechanical knowledge primary test, between using an ordinary wrench or a box spanner on part of one's automobile, requires intelligence for the initial perception and learning of the discrimination (therefore some will never learn it). But thereafter it becomes a crystallized skill, relatively automatically applied ... Fluid ability, by contrast, appears to operate whenever the sheer perception of complex relations is involved. It thus shows up in tests where borrowing from stored, crystallized skills brings no advantage ... In short, fluid intelligence is an expression of the level of complexity of relationships which an individual can perceive and act upon when he does not have recourse to answers to such complex issues already stored in memory." (pp. 98-99)

It is interesting to notice, how in this conceptualization of a so-called psychometric theoretician, notions of knowledge, skill, expertise, and also process shine through. All of these concepts have found extensive investigation within the information processing approach presented next.

Information Processing Approach

The second paradigm in the study of intellectual functioning to be mentioned is the information processing approach. The information processing paradigm originated, among others, from the interest in the processes involved in the mental abilities identified by the psychometric approach (see e.g., Gardner, 1985; Salthouse, 1985 for description of historical development). In the information processing approach interindividual differences are not related to "primary mental abilities" which do not allow further analysis. Rather, it is claimed that interindividual differences exist because individuals use different strategies of information processing and representation. The emphasis of inquiry changed from assessing interindividual differences to providing theoretical models that account for the operation of the human information processing system (e.g., Atkinson & Shiffrin, 1968; Broadbent, 1958).

However, one should not refer to *the* information processing approach as represented by one level of analysis. Many levels of analysis are possible between physiology and phenomenology (Salthouse, 1985); and the different theories and studies summarized under the heading of information processing vary concerning their preferred level of analysis. At one extreme, researchers conceptualized intelligence in terms of speed of information processing (e.g., Jensen, 1980). They devised simple tasks (such as extinguishing a light bulb as soon as it flashes) and used reaction time as indirect measure of this speed. On the other extreme, investigators studied complex forms of problem solving and thus deemphasized speed in favor of accuracy and certain strategies of information processing. Tasks, such as syllogisms, analogies, and series completion, figural relations, and concept identification are examples of this approach (e.g., Clark, 1960; Denney & Palmer, 1981; Dörner, 1979; Hoyer, Rebok, & Sved, 1979; Klix, 1971; Sternberg, 1985a).

It is not the aim of this review to completely cover the information processing approach to cognition. Rather, the present considerations will focus on the age-comparative problem-solving research within the information processing approach because the complexity of tasks used in this research is similar to those used in conventional tests of intelligence.

Considering the range of tasks applied in tests of intelligence (such as verbal comprehension, spatial visualization, inductive reasoning), which processes have been identified as declining with age? Reviewing research evidence on memory abilities, perceptual-spatial abilities, and reasoning abilities, Salthouse (1985) came to the conclusion that dynamic resource characteristics (i.e., arousal level, attentional capacity, basic operation time) in contrast to processing characteristics (i.e., encoding, constructing, transforming, storing, retrieving, searching, comparing, responding; Hussy, 1983; Rose, 1980) are at the center of age-related decline. In particular, a decline in the processing rate of information (slowing) is the most pervasive finding in terms of age-related decrease in intellectual functioning (e.g., Birren, 1974; Cerella, 1985).

Cerella (1985) assembled the latencies of young and old subjects from 189 tasks (such as line length discrimination, alerted reaction time, memory scanning) from 35 published studies and found that a "simple" slowing model seemed to describe the effect of age on mean group reaction times. As conditions of processing load (i.e., arranging task demands to exceed the individual's established level of performance) and the complexity of information processed were increased (i.e., increased number of items to be considered simultaneously), age-related decrease of performance in such problems became even stronger (e.g., Clay, 1954; Plude & Hoyer, 1986).

In studies using more complex but well-defined tasks of problem solving, it was found that not only the efficiency of elementary processes declined but also the effective application of higher-order problem-solving strategies (quality, accuracy). Denney's extensive work on different types of problems, such as the Twenty Question Task (Denney, 1985) or classification tasks (Denney, 1974) is a good illustration of this phenomenon. In the Twenty Question Task, subjects are asked to identify the one item in an array that is "correct" (i.e., represents the concept to be identified). Older subjects were found to ask less constraint-seeking questions than younger subjects do. That is older subjects had to ask more questions in order to arrive at the correct solution. Similar results were found in a study by Adams and Rebok (1983).

In classification tasks, subjects are instructed to classify or sort stimuli which are mostly multidimensional and presented simultaneously. Denney and Lennon (1972) used cardboard figures varying in color, shape, and size and were spread out on a table. The groupings formed by subjects were then analyzed to determine the criteria used to classify the stimuli. Denney (1974) distinguished two types of classification criteria, complementary classifications (e.g., a car and a garage) and similarity classifications (e.g., a car and a train). Older adults, just as very young children, were found to prefer the complementary and younger adults the similarity classification. Quite similar kinds of tasks and results will be discussed in relation with research generated by the Piagetian approach.

Piagetian Approach

Thirdly, the structural or Piagetian approach to the investigation of intellectual functioning is mentioned. Despite the differences in theoretical and historical roots,[3] cognitive structuralism is, like the information processing approach, primarily interested in the processes rather than the products of thinking. However, in contrast to the information processing approach, Piagetian analysis focuses on the Gestalt of thinking styles rather than their decomposition into temporally sequenced elements. In contrast to the psychometric approach, the Piagetian focus is on similarities in ontogeny rather than interindividual differences.

A central feature of Piagetian theory is the conceptualization of cognitive development as invariant, universal sequence of qualitative structural transformations. Piaget's theory proposed that the final stage of cognitive development—formal operations—is attained (if at all) by early adolescence (Inhelder & Piaget, 1958). Piaget (1972) expected no further *structural* change beyond this stage. In the original Piagetian theory only the possibility of what Piaget called "horizontal décalage" was considered. "Horizontal décalage" denotes the developmental lag in the application of mental structure (e. g., formal operations) to particular tasks (domains of thinking). It refers to quantitative rather than qualitative changes (Flavell, 1970).

When concrete and formal operation tasks[4] were applied in age-comparative, cross-sectional studies, the prevailing finding was that old people performed less well than did younger adults (e. g., Papalia, 1972). It should be noted, however, that many of the studies involved deviations from the standard procedures for administering and evaluating Piagetian tasks. These methodological problems make the interpretation of results and comparisons between studies difficult (see Reese & Rodeheaver, 1985 for extensive argument).

Papalia (1972), for example, assessed performance on four conservation tasks (number, substance, weight, volume) in subjects ranging from 6 to over 65 years of age. She found that conservation of number remained stable after early childhood, but that the performance level in the remaining conservation tasks increased until early adulthood and declined in old age. Denney (1982) called in question whether the aging pattern of decline is, in fact, an adequate description of age-related performances on conservation tasks. She explained the possible maintenance of the ability to conserve by more frequent exercise of this kind of task in everyday life.

Clayton and Overton (1973) demonstrated that performance on formal operations tasks (pendulum problem) significantly declined in old age. In the pendulum task subjects are asked to find out what makes a pendulum (a weight suspended from a string fastened at the top to a rod) swing faster or slower. Participants can vary the length of the string, the weight, the dropping point, and the force of a push. Only the length of the string is relevant. Older subjects, as children at the end of the concrete operational stage, identified the importance of the length of the string but assumed that also other concommitant factors were involved. This alleged regression to styles of thinking characteristic of childhood in later adulthood is also supported by studies reporting elderly adults to be more egocentric (e.g., Looft & Charles, 1971) and more animistic (e.g., Dennis & Mallinger, 1949) in their thinking than younger subjects.

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[3] It is an interesting historical fact that Piaget got his start as a psychologist testing in the laboratory of Theodore Simon, a former colleague of Alfred Binet. In this way he began within the psychometric approach, but soon became interested in the kinds of errors children made on the test items (Gardner, 1985).

[4] The Piagetian tasks are not all described here. The interested reader can find descriptions in Sigel and Hooper (1968).

Summary

In sum, the empirical findings of all three paradigms—the psychometric, the information processing, and the Piagetian—suggest decline in intellectual functioning in adulthood. Although the three approaches take quite different perspectives on the study of intellectual functioning and employ different tasks to assess it, there are themes common to all three paradigms. Such themes will be discussed in the next section in terms of various interpretations offered for this pattern of results.

Interpretations of Age-Related Differences in Intellectual Performance: Is it Decline?

Alternative interpretations of the findings presented above have been discussed in the literature which try to answer the following question: Why does performance on fluid intelligence tasks, on problem-solving tasks, and Piagetian concrete and formal operational tasks show age-related losses? Answers to this question range from the clear and definite conclusion of age-related decline in intellectual competence, through the formulation of methodological problems concerning the presented research, to questions concerning the ecological validity of stimulus material. In particular, the critical considerations associated with the latter interpretative approach gave rise to various lines of research on stability and continued growth of intellectual functioning in adulthood.[5] Thus, the presentation will focus on this interpretation and outline the other three interpretative attempts.

Before moving on, it should be noted that various investigators have tried to relate the performance on the three groups of intelligence measures (fluid tasks, problem solving, Piagetian). In a very carefully designed and reported study, Hooper, Hooper, and Colbert (1984) demonstrated the close relation between Piagetian formal operational tasks and fluid intelligence measures. Horn, Donaldson, and Engstrom (1981) found the Twenty Question Task to be closely related to performance on fluid intelligence measures. Consequently, the various interpretations will not always be exemplified separately for each of the three approaches to the study of intelligence.

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[5] Criticism of the decline hypothesis of cognitive aging is not new. It can be traced as far back as the beginning of this century. See Dixon et al. (1985) for a very thorough and elaborate account.

Genotypic Interpretation: "Localizing the Loss"

One of the earliest interpretative attempts found in the literature is to interpret the age-related losses in performance on intelligence measures as biologically determined decay in the morphological substratum underlying intellectual functioning (genotypic decline). Originally, decline had been conceptualized as neurological deterioration. With age, the rate of central nervous system (CNS) breakdown was thought to exceed the development of CNS structures (e.g., Horn, 1970). Recent biochemical findings, however, neither provide systematic evidence for the decrease of brain volume nor for the decrease of number of neurons (e.g., Bondareff, 1985). Rather, a more differentiated picture has evolved. Age-related changes in the metabolic functions of neurons, loss of neural interconnections, and increase in neuroglia are reported.

On the psychological level, the postulated biological decline is interpreted, for example, in terms of the "law of regression of intellectual functioning in pathology and aging" (Hollingworth, 1927; Rubinstein, 1968; Sanford, 1902). Intellectual aging is pictured as a regressive process which proceeds from higher to lower levels of functioning. Summarizing their research with Piagetian conservation tasks, Papalia and Bielby (1974) offered a similar interpretation.

The information processing approach attempts to decompose the decline in intellectual performance. Various psychological correlates of the described physiological change are discussed. Salthouse (1985), for example, offered a processing rate theory of cognitive aging. He viewed the slower rate of carrying out relevant processing operations to be at the heart of age-related decline in intellectual performance. Thus, decline is attributed to a deficiency in a resource characteristic of cognition (see also Birren, 1974; Craik, 1984). Sternberg (1985a), in his componential subtheory of intelligence, linked decline in intellectual performance to the deterioration of the functioning of performance components which could be compared to Salthouse's basic components of the processing characteristics of cognition. Whether it is the process components or the general resource time that is responsible for decline, or whether all decreases of effectiveness (i.e., quality) can be reduced to decreases in efficiency (i.e., time), is an issue of continued discussion.

A number of questions remains unsolved by this genotypic interpretation which is also recognized by some of its proponents (e.g., Salthouse, 1985). To what degree is the decline in intellectual functioning the result of a process of biological adaptation to old-age environments? What role does motivation and emotion play in intellectual functioning? How can the large interindividual differences be accounted for? As the human information processing system is characterized by interconnectedness of its components, the question arises whether it is possible that decline in one component is compensated for by other components. Or whether the slowing down of cognitive processes can be compensated for by the formation of larger-unit processing components. In the following, we will try to suggest answers for at least some of these questions.

Cross-Sectional Versus Longitudinal Evidence

Criticism was raised with regard to the interpretation of results of studies comparing the performance of different age groups at one point in time in terms of genotypic decline in latent intellectual capacity (competence). Rather, it was suggested to distinguish between cross-sectional differences and longitudinal changes. It was claimed that different age groups have lived through different cultural influences and have had different experiences. Cross-sectional differences between age groups are therefore confounded with cohort differences or cohort effect (e.g., Baltes, 1968; Kuhlen, 1940; Schaie, 1965; Schaie & Strother, 1968). Primarily three clusters of possible influences are discussed in terms of cohort effects in life-span development of intellectual functioning (Baltes, 1987): education, health, and work. For example, recent generations have enjoyed (a) improved and more easily accessible education; (b) improved nutrition and medical care resulting in possibly superior physiological brain condition; and (c) most likely recent generations had more contact with IQ tests, thus that they probably have had more practice in these kinds of tasks. Furthermore, (d) on the average, work nowadays may be more strongly focused on cognitively-oriented activities than work 30 or 40 years ago.

The first longitudinal studies were conducted in 1950, 30 years after the first widespread use of intelligence tests among college freshmen in the United States. Results showed little evidence for an early pinnacle (between 20 and 30 years of age) and a general, gradual decline thereafter as cross-sectional research had suggested. On the contrary, longitudinal studies provided a more varied picture across individuals and a later onset of decline. For example, general decline started later in life for fluid abilities, and stability and even growth until very late in life for verbal abilities was observed (e.g., Bayley & Oden, 1955; Owens, 1953). In particular, large interindividual variance in the course of intellectual development emerged calling into question a universal decline.

The differences between cross-sectional and longitudinal results, however, do not allow the conclusion that human development is primarily governed by environmental characteristics. In a cross-sectional design, members of different birth cohorts are compared at one point in time. In a longitudinal design members of only one birth cohort are tested at succeeding points in time. As, for example, Salthouse (1985) has argued, it is not practicable to determine the relative contribution of maturational and environmental influences by comparing cross-sectional with longitudinal data because of the age-dependency of environmental changes. Environmental influences can be age-dependent insofar as the impact of shifts in physical and social environment may be a function of chronological age.

In addition, the interpretation of longitudinal studies had to be qualified because of selective survival and repeated assessment. The criticism was that the results showing less decline were only a reflection of selective experimental and biological survival. Those individuals who remain in the samples of longitudinal studies tend to be the individuals who were above-average performers to begin with. Furthermore, effects of repeated test application had to be taken into consideration. Cohort-sequential analysis which—if treated as cross-sectional and longitudinal sequences—combines the cross-sectional and longitudinal approach in one design, was proposed as a more convincing means to disentangle age-related and cohort differences (Baltes, 1968; Baltes, Cornelius, & Nesselroade, 1979; Schaie, 1965).

Within the Seattle Longitudinal Study (Schaie, 1983) a cohort-sequential design was applied for the first time. The study was launched in 1956 with a cross-sectional sample of people ranging from 22 (born in 1934) to 70 (born in 1886) years of age. The second wave of testing, in 1963, involved the original cross-sectional sample and a new sample ranging from 22 (born in 1941) to 77 years (born in 1886) was added. Later, three more waves of data collection followed in 1970, 1977, and the final one took place in 1984/85. At each new measurement point, a new sample was added. The age range of the new sample was extended by seven years each time. In the final wave, five samples ranging from 22 to 95 years of age were tested. Thus, besides the usual cross-sectional and longitudinal analyses, it was also possible to compare individuals of the same age but belonging to different cohorts and to estimate testing effects.

The interpretation of results from this study after the third wave of data collection (in 1970) had been highly controversial (e.g., Baltes & Schaie, 1976; Horn & Donaldson, 1976, 1977; Schaie & Baltes, 1977). Data of two complete cross-sectional samples, and of two longitudinal samples with two and three measurement points, respectively, were employed to weigh the influences of age and cohort against each other. Critical discussion focused primarily on the interpretation of stability in most functions through the middle years, on the extent of interindividual differences in onset of change, and on the relative emphasis placed on cohort effects.

On the one hand, Baltes and Schaie claimed that earlier longitudinal results were basically confirmed. It had been found that intellectual abilities did not decline before 67 years of age, and that decline was not general (across abilities) and universal (across individuals). Moreover, the extent of intraindividual plasticity needed to be considered before interpreting age differences as indicators of change in latent capacity. On the other hand, Horn and Donaldson argued that results of the cohort-sequential analysis proved exactly a lack in difference between results of cross-sectional and longitudinal studies. Horn and Donaldson maintained that results of the longitudinal samples only represented the ideally possible development of intellectual functioning and had to be more strongly corrected for repeated testing and selective survival.

After the fourth wave of data collection of the Seattle Longitudinal Study (in 1977), it seemed that a compromise had evolved. To summarize, results then indicated decrements in fluid abilities of current American cohorts by about 55 years of age but of smaller magnitude than those observed after the age of 65 years. It should be noted that average aging decline in subjects from age 60 to 80 was only about 2/3 of a standard deviation. Crystallized abilities declined, if at all, only very late in life. The cohort differences for older adults of the same age (but born in 1936 and 1941) were comparable in magnitude to the age-related decrements. Furthermore, large interindividual differences were to be taken into account. Until age 70 there were still some subjects who did not decline at all (Schaie, 1983). Clearly, by definition, a *cohort*-sequential study can only speak to the developmental trajectories of the investigated historical times and cultural settings and, thus, does not claim to describe *the* nature of aging (Baltes & Nesselroade, 1979; Baltes, 1984).[6]

Disuse Hypothesis

Another alternative to the genotypic interpretation has been the consideration of age-related decline in intellectual functioning in terms of disuse or lack of practice with a certain task (Botwinick, 1967). Underlying this argument is the claim that no direct inference can be drawn from declining performance to decline in competence or latent capacity (e.g., Reese & Rodeheaver, 1985).

In this context, Denney developed a theory of unexercised and optimally exercised cognitive abilities (Denney, 1982). She postulated that two different types of developmental functions exist, the developmental function of unexercised or untrained ability (lower level of performance) and the developmental function of optimally exercised or trained ability (higher level of performance). Both developmental functions increase until early adulthood and decrease thereafter. A difference between these two trajectories exists at all age levels. She claimed, however, that the difference is smaller during childhood and old age. As a consequence, training of intellectual functioning is held to have less impact during childhood and old age than at other ages.

Denney related measures of fluid ability to unexercised abilities; she associated tests of crystallized intelligence with exercised ability. Although this theory acknowledges the difference between competence and performance, it does not take into consideration the results of cohort-sequential studies. The assumed decline of both trajectories, the unexercised and the exercised, after early adulthood is based on cross-sectional evidence. Furthermore, this approach ignores the question whether both exercised and unexercised abilities are equally relevant throughout the life span.

Empirical evidence lending some support to the disuse hypothesis is provided by training studies of intellectual functioning. Such research also addresses the issue of the plasticity of development. The following rationale is used in the training studies. Performance after training and practice with tasks used to assess intellectual functioning is compared with the baseline performance before training. Measures of fluid intelligence, in particular, have been the target of training studies with older adults, since fluid skills are—according to theory and empirical evidence—related to inevitable, age-related decline in performance.

As an example, results of ten training studies (about 1,000 older persons) using a similar paradigm (Baltes, Dittmann-Kohli, & Kliegl, 1986; Baltes & Willis, 1982; Willis, 1985) are reported. The training program of these studies consisted of five to ten training sessions distributed over one to two months. During training, reasoning problems similar to those contained in tests of fluid intelligence were explained, solutions were practiced, and corrective feedback was given. Results from these studies have been highly consistent. Older adults displayed improvement in performance levels. The magnitude of observed improvement due to training and practice is approximately one standard deviation (see Figure 4 below). This amount is almost equivalent to the longitudinal decrements found in older adults (see above; Baltes et al., 1984).

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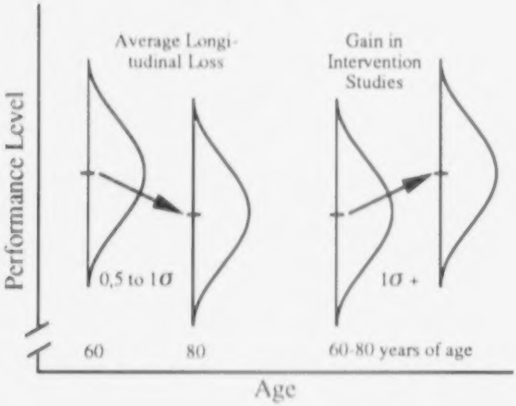
[6] Although only psychometric research has been used to illustrate the argument, similar findings are reported for research on problem solving and Piagetian tasks (see Denney, 1982, for references).

Schaie and Willis (1986) demonstrated that cognitive training reversed cognitive decline documented over a 14-year period in a substantial number of adults. The training also improved the performance of many older persons who had remained stable over that time period. Both findings refer to the abilities of inductive reasoning and spatial orientation. A training study with a fluid ability task (induction) by Labouvie-Vief and Gonda (1976) also provided evidence for increase in older subjects' performance. In this study, subjects were (in addition to the given explanation and corrective feedback) trained to employ self-monitoring strategies. Similarly, the Twenty Question Task and Piagetian tasks were used in training research (e.g., Denney, Jones, & Krigel, 1979; Hornblum & Overton, 1976; Adams & Rebok, 1983). Hornblum and Overton (1976) applied a slightly different procedure, such that only corrective feedback and no prior explanation or instruction was used. Irrespective of procedural differences (tasks, instructions) between training studies, all were successful in raising the performance level of older adults.

In sum, results of training studies seem to suggest that the disuse hypothesis is a viable one to account for a share of the age-related differences in intellectual functioning. In principle, it seems possible that age-related intellectual decline is reversed by training of mental abilities. This is not to claim that young adults would have profited

Figure 4: Magnitude of Average Longitudinal Loss in Performance on Fluid Intelligence Measures Compared to Average Gain Through Training of Fluid Abilities



Note. Cited from Baltes et al. (1984).

less from such training of intellectual abilities. However, as the main focus of this literature review on intellectual aging is to show that there is the *potential* for stability and growth of intellectual functioning in later adulthood and old age, the comparison with the effect of training on young adults is not the issue.

Information processing theory may be helpful in further specifying the mechanisms underlying the disuse hypothesis. Although results do not necessarily indicate the absence of age-related decline in the components involved in test performances, they do suggest that it is possible to affect performance by strategy. Thus, a basis is provided for the hypothesis that one aspect of age differences in intellectual performance is attributable to differences in strategy or control of strategy. However, it is left to further research whether all mental abilities are equally susceptible to training effects.

Ecological Validity

Certainly, tasks of standardized intelligence tests reliably measure, across many samples, certain intellectual abilities; also, both problem-solving tasks and Piagetian tasks are probably good predictors of logical reasoning. Excellent psychometric qualities, however, do not speak for the meaningfulness of the application of such tasks and the meaningfulness of the interpretation of task performance. How often in everyday life are skills used which are similar to those associated with memorizing digit lists or completing logically ordered series of geometrical patterns (fluid tasks)? Skills related to explaining words or answering questions of general knowledge (crystallized tasks) are somewhat more common. Thus, the decline in level of performance found with tests of fluid intelligence is probably of value in, for example, an educational setting or a clinical diagnostical setting. What information, however, is gained about the process of intellectual aging by knowing that older adults have lower scores than younger adults on measures of fluid intelligence? As Keating (1984) quite rightfully pointed out, it is important to keep in mind the purpose for which these measures had been originally developed (i.e., intervention and selection within an educational setting). Traditional intelligence measures were not designed to gain a better understanding of the specific characteristics of adult intellectual functioning as they develop in the transaction between the adult person (biological, psychological) and his/her life ecology (socio-cultural, physical).

This issue pertaining to the interpretation of age-related losses in intellectual functioning in later adulthood is discussed in terms of the ecological validity. Two aspects of ecological validity are distinguished. One refers to the meaningfulness of the *tasks* with regard to the assessment of adult intellectual functioning. The primary concern in this respect is not the issue of laboratory versus so-called real-life tasks (i.e., assessment in a real-life setting), but rather the development of tasks that tap into abilities that evolve as a consequence of older adults' coping with their lives. Tasks of intelligence tests or problem-solving tasks do not reflect the demands of older adults' life settings therefore, they most likely are not meaningful to older subjects. As a consequence, lacking motivation may, for example, play an important part in older adult's performance.

The second aspect of ecological validity is associated with the meaningfulness of *conclusions* drawn from age-related differences in performance on IQ tests, problem solving or Piagetian tasks. Above, we have discussed alternative interpretations in terms of cross-sectional versus longitudinal data and of competence versus performance. Now, we examine the interpretation that decline in intellectual performance may represent a qualitative rather than a quantitative change in competence (e.g., Labouvie-Vief, 1985; Reese & Rodeheaver, 1985). What is interpreted as decline, in fact, may be a difference or even an advantage within the life ecology of an older adult. It is critical to consider the living context before labeling a certain cognitive change as a developmental gain or loss.

A good illustration of the second aspect of the ecological validity argument is evidence of reduced sensitivity in receptors of most elderly (e.g., Corso, 1977; Fozard, Wolf, Bell, McFarland, & Podolsky, 1977) which, on the one hand, can be seen as a loss. On the other hand, the very same change in sensitivity can be viewed as a gain. Jungk (1985) in a subjective account of how he experienced old age, stressed the fact that this reduced sensitivity for external stimuli increased internally-oriented attention; and thus gave rise to insight, intuition, 'binah' (understanding), and a broad perspective. Horn (1978) argued in a similar way. He noted that an intelligence test used with older adults may measure something rather different from what is measured with the same test used with younger persons. As an example, he cited the speed/accuracy trade-offs in fluid ability tasks. A number of studies on that issue (for a review see Welford, 1958) had found that older adults relative to younger subjects seemed to favor accuracy. This preference, however, was not fixed but could be modified by certain incentives. In addition, differences found in the factorial structure of psychometric intelligence between younger and older adults (e.g., Baltes, Cornelius, Spiro, Nesselroade, & Willis, 1980; Cunningham, 1980; Hooper et al., 1984) suggested qualitative developmental changes in intellectual functioning.

The ecological validity argument gave rise to most of the research and theoretical considerations associated with stability and growth in adult intellectual functioning. As the potential for stability and growth of intellectual functioning across the life span is the focus of the present work, theory and data concerning this argument will be presented separately in the next section on stability and growth.

Summary

Four different but interrelated interpretations of the decline pattern of intellectual functioning in adulthood have been discussed. Each explains some aspect of the development of intellectual functioning; none by itself tells the whole story of intellectual aging.

In fact, there seems to be age-related physiological change in the neural brain structure. However, in the first place, we do not definitely know how this biological pattern translates into intellectual functioning. Secondly, we know that biological aging patterns vary considerably between different individuals. And third, physiologically-caused loss in some components of intellectual functioning may be compensated for by other components or on higher levels of intellectual functioning.

Yet, the evidence provided by cohort-sequential and training studies does not completely refute the decline hypothesis either. The picture resulting from cohort-sequential and training studies is a very complex and differentiated one. Interindividual variability is paramount in that picture. Put in quite simple terms, an individual may or may not show age-related physiological change in the brain structure. Given that a certain individual has undergone such change, he/she may or may not be able—depending on internal and external resources—to compensate for it. Baltes (1984), for example, has argued that, at least in part, so-called age differences are a reflection of differences in social and environmental opportunities.

The ecological validity argument offers two ways of dealing with the age-related decrease in level of performance on traditional intelligence measures. One is that results are not relevant in terms of intellectual development across the life span because the tasks do not tap the specific characteristics of adult intellectual functioning and are not meaningful to older adults. The other aspect of this argument is that the criteria of what constitutes high-level performances are not adequate when taking into account the intellectual functioning of older adults as developed in interaction with their particular life setting. What is interpreted as decline, may, in fact, be viewed as different and adaptive in the face of older adults' environmental conditions.

Finally, attention should be drawn to the fact that the studies reported so far have only discussed the normal range of functioning. It has been argued (Baltes et al., 1984; Kliegl & Baltes, 1987), however, that a clearer, less confusing image of age trajectories may be gained when studying performance at maximum levels of functioning. The limits of intellectual functioning in later adulthood and old age, including the limits of its plasticity, are probably not identified within the normal range of functioning.

Theoretical Conceptualizations and Empirical Evidence With Regard to Stability and Growth in Adult Intellectual Functioning

The ecological validity argument just presented resulted in extensive theoretical and empirical work associated with stability and growth in adult intellectual functioning. A selection of this research will be presented below. The intention of the following overview is to provide evidence that there is, in fact, not only age-related decline but also stability and growth and, further, to sketch a picture of possible positive characteristics of intellectual functioning in later adulthood.

As set up in the preceding section, the following considerations will relate to two main lines of thought. One refers to theory and research primarily focusing on the development of more ecologically valid tasks. The other refers to endeavors initiated by questioning the criteria for high performance on the traditional tasks assessing intellectual functioning and moves on to provide more ecologically valid interpretations. It is possible to roughly distinguish the three approaches to intellectual functioning (psychometric, information processing, Piagetian) according to their emphasis on one of the two lines of thought. Therefore, research and theory growing out of the psychometric approach will be primarily presented within the first line of inquiry (validity of tasks). In the second (validity of performance criteria) Neo-Piagetian conceptions and empirical evidence will be discussed. The information-processing approach can not be divided along that line.

The Construction of Ecologically Valid Tasks

Search for Ecologically Valid Contexts

Many authors have tried to theoretically and empirically deal with the problem of ecological validity of tasks when assessing intellectual functioning in later adulthood.

Again, the attempt to develop new tasks is not new: It can be traced back to the first decades of this century. Lorge (1936), for example, demonstrated that, depending on the test used to measure intellectual ability, the relationship between age and ability varied. He concluded that reported mental decline is often "more apparent than genuine" (p. 110). Demming and Pressey (1957) constructed and applied tasks relevant to the knowledge used in mid and later life. For example, subjects had to solve problems with regard to the use of the yellow pages in a telephone directory or with regard to legal terms in common contracts, and with regard to getting help from knowledgeable others. Their results suggested higher levels of performance with increasing age, rather than decrements.

In a recent study by Cornelius and Caspi (1987) employing an Everyday Problem-Solving Inventory, older adults showed higher performance than younger adults. Items of the Everyday Problem-Solving Inventory referred to, for example, consumer problems such as when the landlord refuses to make expensive repairs, or to work problems such as finding out that one has been passed over for a better job. Four modes of responses were offered for each item. The efficacy of each of the four modes for each of the items was rated by judges of three age groups (young, middle-aged, old) to minimize the probability of idiosyncratic definitions of efficient solutions.

However, evidence in this line of research is not unequivocal. Other attempts to construct and apply tasks closer to real-life problems have failed to prove increments with increasing age (e.g., Arenberg, 1968; Bromley, 1957; Craik & Masani, 1967; Denney, Pearce, & Palmer, 1982). Arenberg (1968), for example, retained the paradigm of a concept learning task, but instead of using abstract geometric stimuli, he employed food names and subjects were told that one of these foods was poisoned. Subjects were then presented with "meals" of a list of three foods at a time. After each presentation the subject had to decide whether the person who ate the presented "meal" lived or died. The subject's task was to determine which of the foods was poisoned. Arenberg found that older subjects showed lower performance levels than younger adults.

Denney, Pearce, and Palmer (1982) employed a rather elaborate design to investigate subjects' performance on ecologically valid tasks. They constructed three types of practical problems: One was supposed to be most valid for young adults (A college student wants to go home for Christmas but does not have enough money to cover travel expenses. What should he do?), one problem was designed to be valid for middle-aged adults (A middle-aged woman is frying chicken, suddenly the fat catches fire. What should she do?), and finally one problem was designed to match older adults' everday problems (What should an old woman do who lives on social security and does not receive her monthly check?). The authors reported that performance on the "young" problem decreased at the onset of early adulthood. On the two other problems performance increased until the thirties, remained stable through the fifties, and declined thereafter.

After taking a closer look at those allegedly ecologically valid tasks used, for example, by Arenberg, the confirmation of age-related decline in intellectual functioning is not surprising. As Labouvie-Vief (1980, 1982, 1985) has argued most forcefully, such tasks are still built around the same logical structure (i.e., linear thinking or inductive reasoning) as the more abstract, original tasks. The logical structure is simply embedded in a content domain closer to real life.

A recent study supports this argument. Willis and Schaie (1986) conducted a study with the ETS Basic Skill Test (Educational Testing Service, 1977) which was constructed to assess real-life competencies. The 65 test items were grouped into eight categories such as labels, maps, charts, paragraphs, forms, advertisements, technical documents, and news texts. Tasks refer to, for example, interpreting the instructions on medicine bottle labels or calculating daily dietary allowances. Willis and Schaie found that scores of such real-life tasks loaded most highly on the factor "fluid reasoning" which is not surprising considering the logical reasoning structure of the problems.

The following explanation extends the argument of equal logical structures, especially with reference to the tasks used in the study by Denney and her colleagues. Ecological validity is still threatened, even when the task is simulating a real-life problem. The threat of ecological validity then is related to the criteria that define levels of performance. Denney and her colleagues defined four levels of perfomance for each problem. One aspect in their rating of the quality of solutions was, for example, number of offered solutions which is a criterion very close to the fluid ability of ideational fluency. Their scoring scheme did not consider that because of individually different life experiences the best response to the problem may differ between persons. It is doubtful whether other people would have independently arrived at the same scoring criteria.

The same argument is illustrated by the following study that administered a real-life task in a real-life setting. Shoppers in a supermarket were asked which of two sizes was the better buy for two products (Capon & Kuhn, 1979). The experimenter defined the best response to be calculating price differences and buying the size with the lower price per ounce. Other conceivable strategies were ignored, like the option to always buy a certain brand or to always buy the larger package.

The examples described and discussed above already indicate that attempts to deal with issues of ecological validity present us with many new problems. The following aspects seem to be paramount. Using the content domain "everyday life" to put the logical reasoning structure of a problem in concrete form is important, however, it is not enough. It seems that problems arising in everyday life are also related to certain modes of thinking differing from pure logic (Labouvie-Vief, 1985). A further complication relates to the determination of criteria of high-level performance on practical problems. In contrast to abstract logic problems there is not only one "right" answer to such ecologically valid tasks. Consequently, consensus has to be employed as the criterion for the best solution. In the succeeding paragraphs, the specific features of everyday practical problems will be further elaborated from an information processing perspective.

Validity of Context is not Enough: Knowledge System and Expertise

The complications enumerated above are unravelled to some extent when attending to a recent development in cognitive psychology that originated from artificial intelligence research: the shift from power-based to knowledge-based production systems (Minsky, 1975). Taking the latter perspective, quantity and quality of knowledge become important dimensions of interindividual differences in intellectual functioning. High levels of performance are then studied as expertise in a given knowledge domain.

Expertise is characterized by a large and well-organized body of knowledge (declarative knowledge) and by a rich and elaborate supply of procedural skills (procedural knowledge) (Chi et al., 1982). The distinction between declarative knowledge as "knowing that" and procedural knowledge as "knowing how" had been introduced by Ryle (1949). Declarative knowledge refers to concepts, facts, situations, events, attitudes, and beliefs about a knowledge domain; and procedural knowledge refers to knowledge concerning processes of knowledge acquisition, manipulation, retrieval, and application. These two types of knowledge should be understood as ideal types of heuristic value rather than exclusive categories. Some authors use instead the terms "knowledge" versus "skill" or "strategy." The discussion concerning the domain-generality versus domain-specificity of procedural skills related to the shift from power-based to knowledge-based production systems is still in full swing (e.g., Oswald & Gadenne, 1984). It seems, however, that general strategies applicable across domains as well as domain-specific procedures can be identified within a knowledge system (Anderson, 1987).

A knowledge domain can be characterized as being well-defined versus being ill-defined. A domain is well-defined if it consists of a finite body of knowledge and objective criteria that allow judgement on the quality of knowledge. Also problems can be described along this dimension. Simon (1973) outlined ill-defined problems as not providing all the information needed to solve the problem; criteria for when the problem is solved; and one specific algorithm for finding all alternatives at each step in the problem-solving process. Although the concept of expertise has evolved from research in rather well-defined domains, its framework for describing an individual's knowledge system and for studying the effects of knowledge on cognitive performance seems to be as suitable for ill-defined knowledge domains (see also Brown, 1982; Glaser, 1986).

Individuals are assigned a place on the contiuum between novice and expert depending on their performance in the knowledge domain under study. At the expert level of performance the factual components of a knowledge system are appropriate and flexible subjective representations of some reality. The expert problem solver differs from the novice not primarily in quantity of knowledge but in quality concerning the organization of the knowledge system. It is the differentiation and elaboration as well as the integration of knowledge components that are distinctive features of "declarative expertise." The expert-level performance, in terms of the procedural aspects of a knowledge system, is characterized by high efficiency in the application of factual knowledge. A system of control processes monitors performance in order to balance between speed and accuracy and between "accommodation" and "assimilation." Depending on the character of the knowledge domain, quality of performance is judged according to objective criteria or to social consensus.

The concept of expertise also offers an ontogenetic model of skill acquisition (Anderson, 1982). Anderson proposed three acquisition stages: (1) learning facts and basic procedures, (2) integration of facts and procedures and the evolvement of effective strategies, and (3) fine-tuning of the knowledge system through processes like generalization, discrimination, and strengthening as to a point where the system is highly elaborate, integrated, and efficient.

Relating the cognitive science approach to the complications associated with the ecological validity of tasks assessing intellectual functioning results in the following "implications." Some of these are similar to what Labouvie-Vief (1985) has derived from a life-span contextual critique of Piagetian theory. The attempts to design more ecologically valid tasks discussed so far, mostly took the declarative knowledge component of a given domain into account (e.g., knowledge domain "shopping," "food"). They did not pay attention to possibly related changes in procedures or strategies, nor to the fact that the knowledge related to everyday life is mostly ill-defined (i.e., there are no objective criteria to determine the quality of a given solution). Rather, it was assumed that strategies, such as "linear thinking" (logical reasoning) cut across knowledge domains and represent an absolute standard for high-level intellectual performance.

In this respect the research (however not age-comparative) and theoretical considerations concerning pragmatic reasoning schemata recently reported by Cheng and Holyoak (1985, 1986) is very interesting. Cheng and Holyoak proposed that people typically do not reason about realistic situations in terms of content-free, syntactic inference rules or representations of specific experiences. Rather, people reason using abstract knowledge structures induced from ordinary life experiences, such as "permission," "obligation," and "causation." They termed such knowledge structures "pragmatic reasoning schemata," which are generalized sets of rules defined in relation to classes of goals. In the following paragraphs, a number of attempts will be presented which try to consider also procedural knowledge when dealing with the problem of ecological validity of measures of intelligence.

Characteristics of Expertise in Well-Defined and Ill-Defined Knowledge Domains

Once criteria for high-level performance are determined either by objective criteria or by consensus, the characteristics of expertise can be delineated. Research presented in this section is characterized by two major interests. The one concerns the question of how expertise develops, and the other refers to the simulation of real-life problems. Thus, the studies reported are mostly not developmental, that is, age is not a design variable. Some of them are, however, developmental in the sense that they inquire into the development of expertise over time. For some authors, both life-span development and the acquisition of expertise are closely related in the sense that it takes time to develop an expertise. These authors use the terms cognitive maturity and expertise synonymously (e.g., Brown, 1982). In most of the studies, expertise is confounded with chronological age (i.e., experts are usually older than the novices). In contrast to an exclusively cognitive psychologist who would try to disconfound expertise and experience, a life-span developmentalist is, in fact, interested in the particular growing expertise possibly related to increasing age. In this respect, the expertise paradigm could be used as evidence for stability and growth in intellectual functioning with age.

How does expert (i.e., mature) performance differ from that of a novice who has very little experience with and very little knowledge about a given knowledge domain? Differences are not primarily associated with a larger body of declarative knowledge (quantity) but with a more refined organization of knowledge (quality) and more automatized application (intuition). Studies with problems derived from rather well-defined knowledge domains, like chess (Chase & Simon, 1973; de Groot, 1965) or physics (Chi et al., 1982; Larkin, McDermott, Simon, & Simon, 1980) suggested the following main characteristics of expertise:

- Memory chunks of chess experts are of bigger size and are grouped by more higher-order categories (de Groot, 1965);
- Chess experts intuitively decide on a move and then test their choice by a limited search of the problem space (Chase & Simon, 1973);
- Physics experts have more knowledge about the conditions of applicability of physics laws (procedural knowledge);
- Experts transform the surface structure of the problem into the underlying principles of the deeper structure (Chi et al., 1982);
- Experts recognize patterns of information that allow them to deduce further pieces of information (Larkin et al., 1980).

A similar characterization of differences between expert and novice performance was proposed for comparatively ill-defined knowledge domains, such as medical diagnosis (e.g., Lesgold, 1984), and tasks specific to other professions (e.g., Klemp & McClelland, 1986; Scribner, 1986; Sternberg & Wagner, 1986), and societal and political decision-making (e.g., Dörner, Kreuzig, Reither, & Stäudel, 1983; Voss, Greene, Post, & Penner, 1983). One characteristic of adult life is indeed the development of knowledge in specific domains, especially related to occupation or profession but also related to tasks in the family or public domain. Listed below are some examples of performances characterizing experts in such knowledge domains:

- Expert radiologists have, when compared to novices, more refined and elaborated schemata for diagnosis and they can more precisely localize anatomical structures (Lesgold, 1984);
- Senior managers are described as possessing, in combination, high intellectual competencies (planning/causal thinking, diagnostic information seeking, conceptualization/synthetic thinking), high influence competencies (concern

for influence, direct influence, collaborative influence, symbolic influence), and high self-confidence (Klemp & McClelland, 1986);

- Skilled workers in a milk-processing plant are able to construct or redefine a problem such that the solution process is facilitated. Furthermore, skilled workers are flexible in terms of which problem-solving strategy to apply under which circumstances. The environment is exploited for problem solution as well as for problem formulation, and often they choose the most economical solution (Scribner, 1986);
- Social science experts, like those in physics, form their problem representation upon the conceptual relations underlying the surface statements of the tasks, and often show that a more general solution implies the solution of a number of subordinate problems (Voss et al., 1983);
- Experts in controlling computer-simulated, complex and dynamic systems (systems thinking) can translate only vaguely-indicated goals into more concrete terms by constructing subgoals and attributing importance to them. They balance a variety of competing goals by setting time-bound goal priorities without neglecting the rest of the system. They are able to enhance their knowledge about the system by asking the right questions, forming analogies, and applying general structural schemes (e.g., the notion of positive or negative feedback), and at the same time recognize the adequate level of resolution for a given problem. In addition, experts demonstrate distinct self-management during the problem-solving process (e.g., Dörner et al., 1983);
- High-level performers in academic psychology and management (as identified by a nomination procedure) were found to have more tacit knowledge than novices. Tacit knowledge is not openly stated, it has to be inferred or gained by practice in the field. Three components characterize tacit knowledge: managing the self, managing the task, and managing others. Furthermore, tacit knowledge has a short-term and long-term orientation, and implies a distinction between what actually works and what ideally should work (Wagner & Sternberg, 1986).

In addition, there is a growing number of studies comparing old and young experts (e.g., Charness, 1981; Salthouse, 1984). Charness (1981) conducted a study with chess players, ranging in age from 16 to 64 years and in skill from low to high official skill ratings. He found the quality of solutions to vary with skill but not with age. Charness noted that older players exhibited memory deficits characteristic of aging and that they apparently took short cuts on some steps in solving the problems. In a similar vein, Salthouse demonstrated in a study with young and old expert typists that both young and old experts did not differ in speed of typing, although older experts showed typical age-related increases in reaction time. By means of his experimental design, Salthouse could demonstrate that older experts made up for their longer reaction times by looking further ahead in the text to be typed. Both studies illustrate compensation mechanisms of age-related deficits. Such compensation mechanisms presumably capitalize on experience.

Studies with young and old experts show that, depending on the expert's position in the life course, the characteristics of expertise seem to vary. Experience (practice or training) not only furthers the transition from novice to expert but, in addition, once a level of expertise (i.e., official skill rating in chess, a certain defined speed of typing) is reached, further practice as well as possibly age-related changes in the information processing system seem to modify the structural characteristics of the expertise. Such further changes are probably associated—to an even greater degree than the development from novice to expert—with the organization of knowledge and the refinement of procedures of knowledge application (see also Anderson, 1982).

A comparison of the two lists of features, characterizing experts in well-defined and ill-defined domains respectively, suggests that it seems to be appropriate to apply the concept of expertise to an ill-defined knowledge domain also. Experts of an ill-defined and a well-defined knowledge domain share a common set of characteristics (e.g., refined, elaborated categories and strategies; moving beyond the surface structure of a problem). In the case of ill-defined knowledge domains the expertise notion is extended beyond that common set of characteristics by features such as personality characteristics (e.g., the ability of self-management), by interpersonal abilities, and by synthetic or systems thinking. Expertise in ill-defined knowledge domains seems to combine cognitive and affective components. We should keep in mind such features of an extended expertise notion when models of mature thinking are discussed in the next section.

Towards More Valid Interpretations of Performance Indexing Adult Intellectual Functioning

Research and theory presented below is based on the assumption that older adults' performance on traditional tasks assessing intellectual functioning, especially on tasks of logical reasoning, indicate qualitative changes of intellectual functioning rather than quantitative deficits. Thus, results should be interpreted differently depending on the age of the respondent. For example, results of age-comparative studies with the classification task have been, on the one hand interpreted as indicating regression with age (e.g., Denney, 1974; Papalia & Bielby, 1974). On the other hand, it has been argued that the preference of older adults for functional categorizing (complementarity; e.g., car and garage) versus the younger subjects' preference for lexical categories (similarity; e.g., car and bus) is a matter of stylistic differences which are equally adaptive for both age groups (Kogan, 1974).

Models of mature thinking

In her theory of mature autonomy, Labouvie-Vief (e.g., 1982, 1985; Labouvie-Vief & Lawrence, 1985) has questioned the validity of models of formal logic for the demands on adult adaptation. The image of cognitive maturity related to Piaget's stage of formal operations is one of an individual being able to think and act in a world of possibility rather than just reality. Performance at a formal operational level involves the ability to engage in abstraction outside of the context of pragmatic considerations. Labouvie-Vief has claimed that the resulting high degree of flexibility achieved by such cognitive behavior is adaptive in youth, when acquiring new skills is deemed to be the major life task. In adulthood, however, commitment becomes the predominant life theme. Adults have to commit themselves to one pathway, and take on responsibility (Labouvie-Vief, 1985). Labouvie-Vief has maintained that for this kind of life demand a different style of thinking is optimally adaptive.

Labouvie-Vief (1982)—and in a similar way Pascual-Leone (1982)—have offered conceptualizations of the development of adult intellectual functioning beyond the stage of formal operations.[7] The models presented here represent the notions advanced by a number of other scholars, such as Basseches (1984), Commons, Richards, and Armon (1984), Edelstein and Noam (1982), Riegel (1973), and Sinnott (1982). Riegel (1973), in particular, was the person who historically shaped this line of reasoning.

The point of departure of post-formal development is an individual's assumption of universal truth criteria (which characterizes formal operations): This style of thought is labelled the intrasystemic logical mode by Labouvie-Vief or dualistic thinking by Pascual-Leone. The following level, called intersystemic thought (Labouvie-Vief) or differentiation (Pascual-Leone), is characterized by the individual's ability to assign truth taking the perspective of multiple systems. In the final stage of mature autonomy (Labouvie-Vief) or of ego transcendence (Pascual-Leone), truth criteria are redefined by the individual's ability to arrive at commitments out of a confrontation with multiplicity. Thus, autonomy arises from the awareness of the genuine complexity of social systems.

Characteristics of Mature Thinking

Quite a number of studies have been conducted within this and similar theoretical frameworks and various descriptions of the characteristics of post-formal thought (i.e., mature thinking) have been offered (e.g., Arlin, 1984; Basseches, 1984; Blanchard-Fields, 1986; Cavanaugh, Kramer, Sinnott, Camp, & Markley, 1985; King, Kitchener, Davison, Parker, & Wood, 1983; Kuhn, Pennington, & Leadbeater, 1983). The following characteristics of mature thinking have emerged from such research endeavors and will be described in more detail below: problem finding, relativistic thinking, dialectical thinking, acknowledgement of context and uncertainty, integration of emotion and cognition.

(a) *Problem finding.* A first putative feature of mature thinking in adulthood involves the ability to find problems in addition to solving problems. More mature thinkers are described as being better able to redefine the problem space by accepting the task-inherent uncertainties and to delineate dimensions in order to resolve these ambiguities. Mature thinkers transcend known systems in search for new systems that create new problems. In contrast to mature thinkers, immature thinkers tend to stay within the given facts and look for a correct solution (e.g., Arlin, 1975, 1984).

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[7] I shall not discuss here whether the development beyond Piaget's stage of formal operations is to be considered a new structural stage or not (e.g., see Kramer, 1983). Rather, emphasis will be put on the various features reported as characterizing adult intellectual functioning.

As a measure of problem finding, Arlin (1975) had subjects raise questions about 12 common objects. The level of generality and abstraction expressed in the questions was taken as an index of problem finding. It is interesting to note that similar differences have been found in studies comparing experts with novices in solving complex problems (see above, p. 49; e. g., Chi et al., 1982). Problem finding, as a feature of mature thinking, seems to be especially adaptive for coping with complex, ill-defined problems. Also within the so-called "systems thinking" approach, advanced by such investigators as Dörner, goal definition and goal differentiation are of central importance for successful problem solving (Dörner et al., 1983).

(b) *Relativistic thinking.* A second putative feature of mature intellectual functioning is relativistic thinking. In a cross-sequential design with a time lag of four years, Armon (1984) investigated the development of value systems, in particular the reasoning about what is "good" and what a "good" life entails. Her results suggested that post-formal reasoners evince a coherent and holistic value system which allows them to accept the existence and legitimacy of other value systems.

Similarly, some studies provide evidence concerning the development through stages of relativistic thinking (e. g., Kuhn, Pennington, & Leadbeater, 1983; Leadbeater, 1986; Leadbeater & Kuhn, 1987). Kuhn and her colleagues devised the so-called Livia task to assess levels of relativistic thinking. The task introduces the Livian War as an historical incident and then offers two opposing historical accounts. Subjects are asked to first give an account of the Livian War in their own words and then are presented with a number of questions probing their interpretation. As a second empirical source, Kuhn and her colleagues employed jurors' reasoning about their verdict decisions in actual trials. The model of Kuhn, Pennington, and Leadbeater (1983) conceptualized development of relativistic thinking to start in childhood and not to be confined to adult forms of thinking. So far, no specific comparisons between young, middle-aged, and older adults have been conducted. Kuhn and her colleagues suggested relativistic thought to develop from realism through predualism, dualism, radical relativism, objective relativism, to conceptual relativism.

In the context of adult cognition, the last three levels of relativistic thought are of primary interest. The radical relativist believes that everyone has a right to his/her own opinion, objectivity is renounced. In contrast, the objective relativist constrains this view by claiming that facts can be discovered through appropriate inquiry; thus, one perspective is superimposed. Finally, the conceptual relativist attributes differences in interpretations to differences in the historical, cultural, and ideological context in which a certain judgement is made (Mandelbaum, 1979). Thus, the conceptual relativist expects multiple interpretations of events and recognizes that different accounts of the same incident are not subject to reconciliation by appeal to fact.

(c) *Dialectical thinking.* Dialectical thinking is a third putative feature of mature intellectual functioning. Research and theory on dialectical and relativistic thinking are closely related; however, it seems that the latter more explicitly moves one step further than the former. The conceptual relativist's multiple accounts are integrated into a dialectic whole (i. e., dialectic synthesis). Yet, the distinction between these two terms is not strictly adhered to in the literature. Often, the term "relativistic thinking" is employed to denote both the consideration of multiple accounts as well as their

Table 1: Categories of Relativistic and Dialectical Thought

Awareness of the relativistic nature of knowledge

(a) Pragmatism
(b) Contextualism
(c) Change as basic to reality
(d) Uniqueness – indeterminacy

Acceptance of contradiction

(a) Statement of conflict
(b) Contrasting systems
(c) The implication of an event's opposite

Integration of contradiction into the dialectical whole

(a) Integration
(b) Movement through forms
(c) Reciprocity

Note. Cited from Kramer and Woodruff (1986). The first category was omitted.

integration into a dialectic whole.[8] Kramer (1983) cited the following three features of mature thinking as a common denominator of a number of models of post-formal thinking (e.g., Basseches, 1984; Commons, Richards, & Armon, 1984; Riegel, 1973; Sinnott, 1984): understanding of the relativistic nature of knowledge, acceptance of contradiction as part of reality, and integration of contradiction into a dialectic whole.

In a study by Kramer and Woodruff (1986), these features were employed as sequentially ordered levels of mature thinking and at the same time used as coding categories for the analysis of response protocols. In this study, Kramer and Woodruff (1986) assessed relativistic and dialectical thought via two dilemmas, each representing a conflict between two opposing elements (i.e., thesis and antithesis). One dilemma, the career dilemma, centered on a woman's decision about whether to enter the workforce for the first time. The second task, the hostage dilemma, centered around a hostage crisis, where both parties involved had potentially "constructive" intentions. Results demonstrated that in general, older adults showed less rejection and more acceptance of relativistic and dialectical assumptions than the young and middle-aged subjects.

Table 1 (see above; cited from Kramer & Woodruff, 1986, p. 283) lists three out of four levels of relativistic and dialectical thinking (omitting the first one) together with respective subcategories. In comparison to Kuhn's model of relativistic thinking, two new aspects are introduced here. First, the highest level "integration of contradiction" moves beyond the acceptance of contradiction to the integration of contradiction into a new, more encompassing whole. The dialectic whole, however, is not the final solution but in turn yields new conflicts. Second, the subcategories "contextualism" and "uniqueness-indeterminacy" of the first level "awareness of the relativistic nature of knowledge" make explicit two other features of mature thinking.

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[8] Oser and Reich (1987) introduced as a third term into this discussion the notion of thinking in terms of complementarity. They argued that in contrast to dialectical thinking which integrates thesis and antithesis, complementary thinking can integrate more than two solutions for a given problem. Oser and Reich proposed that in everday life one usually has to weigh more than two solutions against each other.

(d) *Contextualism and uncertainty*. The terms "contextualism" and "uncertainty" are used here to describe the fourth putative feature of mature thinking. The subcategory "contextualism" (see Table 1) indicates that the broader social, historical, moral, and physical context influences an individual's action in a given situation. Indirectly this notion of contextualism is also contained in the levels of relativistic thinking outlined by Kuhn and her colleagues (1983). However, it is suggested here that it may be useful to disentangle the various aspects of the very complex notion of relativism.

A further additional aspect of mature thought becomes clear from Table 1, namely that change is an inherent feature of reality ("indeterminacy") and that each person, situation, society, etc. is unique ("uniqueness"). Consequently, there is no absolute certainty about what will happen in the future neither about why things happened in the past. Meacham (1983) was probably the first to refer to uncertainty as a correlate of increasing knowledge. The more we know, Meacham claimed, the more we become aware of what we don't know. The certainty of human knowledge is also a feature of Kitchener and King's (1981) stage model of reflective judgement. The human understanding concerning the certainty of knowledge develops through seven successive stages. It begins with absolute certainty, moves through absolute uncertainty, and culminates in stage seven, which Kitchener (1986) described as "certainty that some knowledge claims are better or more complete than others although they are open to re-evaluation." (p. 79)

(e) *Integration of emotion and cognition*. The final putative aspect of mature thinking to be mentioned is still empirically quite neglected. Except for Labouvie-Vief's work, theoretical formulations are yet quite vague in character. Nevertheless, the integration of emotion and cognition is discussed here because intuitively it seems to be an important feature of maturity. Most of the tasks we are presented within life evince influential emotional and interpersonal components. Indirectly this feature of mature thinking has been addressed above, when professional expertise (p. 50; e.g., Klemp & McClelland, 1986; Wagner & Sternberg, 1986) was described as including—among others—abilities of self-confidence and interpersonal skills, or when the characterization of systems thinking stressed the importance of self-monitoring abilities as a feature of an expert problem solver (Dörner et al., 1983).

Labouvie-Vief (1984), in particular, has argued that the integration of the cognitive and the emotional system is one of the core characteristics of a mature thinker (see also Edelstein & Noam, 1982; Gilligan, 1977; Roodin, Rybash, & Hoyer, 1984). The integration of emotion and cognition in the mature thinker is highlighted by a study by Labouvie-Vief, Adams, Hakim-Larkin, and Hayden (1983) on the contexts of logic. Labouvie-Vief and her colleagues (1983) demonstrated that immature thinking was associated with a confusion between logic as a product (which determined the interpretation) versus logic as an argument structure to fit many different interpretations. This research can be viewed in relation to the above cited studies by Cheng and Holyoak (1985, 1986). Cheng and Holyoak referred to the latter employment of logic as a pragmatic reasoning schemata.

In a further empirical study, Blanchard-Fields (1986) investigated age-related performance differences on tasks varying in affective saliency and in conflictual interpersonal content. The Livia task (described above; Kuhn et al., 1982) was employed as a problem with low affective saliency and little conflictual interpersonal content. A visit-to-the-grandparents conflict and a pregnancy dilemma were designed as two tasks with high affective saliency and a high degree of interpersonal conflict. Results obtained by Blanchard-Fields (1986) showed that adolescents performed less well than young and middle-aged adults on tasks higher in emotional saliency. In addition, ego level (as measured by Loevinger's Sentence Completion Test; Loevinger & Wessler, 1978) proved to be the best predictor of social reasoning.

Summary

To summarize this section on research and theory concerning stability and growth in adult intellectual functioning, it is first argued that there is some evidence for the advancement of select knowledge systems throughout the life span, given that such knowledge systems are of importance to the life ecology of later adulthood and to the specific individual, and given the fact that individuals age healthily from a biological point of view. Second, the unequivocal interpretation of the data presented earlier in terms of universal and general decline in levels of intellectual performance is to be called into question when considering the results of cohort-sequential studies, of training studies, and when age-specific life setting characteristics and demands are taken into account. Finally, a number of approaches (expert problem solver, mature thinker) have been introduced that describe in detail the possible avenues in which adult thinking might evince advances, at least under optimal societal and biological conditions.

Three Theoretical Attempts to Integrate Empirical Evidence on Decline, Stability, and Growth

A Triarchic Theory of Intellectual Development in Adulthood

The triarchic theory of intelligence (Sternberg, 1985a) and its application to the development of intellectual functioning (Berg & Sternberg, 1985) is built on the distinction between fluid and crystallized intelligence, but moves beyond it by adding everyday and social competence as important aspects of intellectual functioning. Sternberg (1985a) proposed a contextual, an experiential, and a componential part of intelligence. He argued that beyond the traditional research on fluid and crystallized intelligence, a new coordinated look at all three components of intelligence would be helpful to advance the field.

The triarchic theory of intelligence tried to consider the disuse argument and the ecological validity argument presented above. The experiential component of intelligence incorporates Denney's theory of exercised versus unexercised cognitive abilities. The contextual component considers the interactive relationship between real-world environments and a person's intellectual abilities. By means of his/her mental activity a person adapts to, but also shapes and selects environments relevant to his/her life. Finally, the componential part of intelligence in Sternberg's theory can be traced back to the information processing approach to intelligence.

Sternberg and Berg explained developmental differences in measures of crystallized and of fluid intelligence by the interaction of the three components of intelligence. More specifically, it is assumed that fluid intelligence tasks require novel ways of operation and, thus, assess the current execution of components. Crystallized intelligence tasks involve the use of mental mechanisms in a more automated way. Therefore, Sternberg claimed that in some sense measures of crystallized intelligence do not assess current componential functioning but past componential performance. To measure current componential functioning is not, however, the only important condition to be fulfilled when trying to assess adult intellectual functioning. Furthermore, a critical question is whether tasks are equally relevant to the individuals (contextual component) and equally novel for the individuals to be compared (experiential component). Sternberg considered the ideal task for the assessment of intelligence to be one which is on the verge of becoming automatized. For task construction, this implies finding a problem that is, for example, not totally new to the subject but has been present in the subject's life for some time. Another possibility is to take a familiar task and change the setting in which it has to be solved.

An Encapsulation Model of Cognitive Development in Adulthood

Another recent attempt to integrate the empirical evidence on decline, stability, and growth is the encapsulation model of cognitive development in adulthood as proposed by Rybash et al. (1986). They suggested that basic mental resources become increasingly dedicated to and encapsulated within the form of domain-specific knowledge. Fluid abilities and control processes appear to decline as they become encapsulated within domain-specific knowledge representations. The process of encapsulation may enable adults to compensate for their reduced ability to acquire new knowledge.

Combining the structuralist tradition with latest developments in cognitive psychology, Rybash and his colleagues proposed that through the development of expertise in selected domains adults become capable of defining problems in a new way, of solving the ill-defined problems of real life, and of producing creative and elaborate work within their areas of expertise. This conception of intellectual life-span development implies that various aspects of intellectual functioning can be differentiated and that these aspects may evince different developmental trajectories. The encapsulation model also suggests that depending on the environment, a person will develop expertise in different domains.

A Three-Tier Conception of Cognitive Development

Another model that attempts to integrate aspects of decline, stability, and growth in the development of intellectual functioning is Perlmutter's three-tier conception of cognition (Perlmutter, 1988). The first most primitive tier, which Perlmutter called mechanized skills, includes basic mechanisms of cognition or fluid abilities. The second tier, termed crystallized skills, is associated with world knowledge or crystallized abilities. At this tier, external experiences are recorded rather passively. Finally, the third tier refers to so-called synthesized skills, such as logico-mathematical structures, general heuristic strategies, and higher mental functions. The third tier provides the individual with the ability for adaptive modification of the environment.

These three tiers make up the cognitive system. The first tier is assumed to be present at birth, the second tier to emerge post-natally, and the third tier to be probably fully developed only later in life. The development of the cognitive system is influenced by the biological system as well as the social and the physical environment. However, Perlmutter did not claim that cognitive performance over the life span is genetically determined but rather that there is plasticity depending on personal and environmental resources. Perlmutter assumed the last two tiers of her model to be relatively immune against age-related deterioration.

The Life-Span Approach to the Development of Intellectual Functioning

In the remainder of this section, the life-span approach to the development of intellectual functioning will be depicted. As the life-span perspective is a central piece of the theoretical framework of the present study, special emphasis is put on its discussion. Similarities to and differences from the models introduced above will be pointed out along the line.

The presented evidence and theoretical explanations concerning intellectual functioning in later adulthood, demonstrated that—although pervasive—the undifferentiated picture of decline of intellectual functioning in adulthood may be too simplistic. It appears too simplistic to describe the life-span trajectory of intellectual functioning as one of development (growth) until early adulthood and as one of aging (decline) thereafter.

Some attention should be given to the selection of terminology in this last sentence. It reflects the prevailing usage of the terms aging and development. In an attempt to come to grips with the presented empirical evidence, I suggest that a reconsideration of the terms development and aging is necessary.

Central Terms: Development and Aging

In the first chapter, it was argued that a widespread negative aging stereotype and a confusion of disease-related (secondary) with normal (primary) aging heavily burden the term "aging" with negative connotations. The term "development," on the other hand, primarily raises connotations of childhood or adolescence and growth. Such usage finds support in a biological definition of development as increase and aging as decrease in adaptive capacity (e.g., Comfort, 1979; Handler, 1960).

Within the life-span perspective, however, development is conceptualized as systematic and successive change of a human being's capacity to adapt as well as to shape and select the environment (e.g., Baltes, 1983, 1987; Honzig, 1984; Lerner, 1984; Sherrod & Brim, 1986). Both positive *and* negative changes in adaptive capacity are labelled development and can take place at any given time in the life span. Developmental changes have to be systematic and organized in character and, at least partly, changes at a later time should be influenced by changes at an earlier time in life.

Provided with such a basic understanding of the terms "development" and "aging" from a life-span perspective, helps us not to be overwhelmed by the picture of great variability that empirical evidence concerning intellectual functioning over the life span has presented us with. Instead of interpreting the empirical evidence in terms of irregularities, the life-span approach to development helps to delineate some forms of regularity.

Eight Propositions Concerning the Life-Span Development of Intellectual Functioning

Baltes and Willis (1979) suggested four concepts to characterize regularities in life-span development of intellectual functioning: multidimensionality, multidirectionality, interindividual variability, and intraindividual plasticity. Elaborating on these four concepts, Baltes and colleagues (1984, 1986) and Baltes (1987) tried to capture the complexity of intellectual life-span development in a family of propositions with specific emphasis on the dynamic interplay between growth, decline, and stability at any stage of life-span development (see Table 2; summarized from Baltes et al., 1984, pp. 39–59).

Table 2: Propositions about Intelligence in Adulthood and Old Age

1 There is stability in capacity for "average" intellectual functioning until the 60s.

2 If age-related decline in capacity for intellectual functioning exists, it will be manifested primarily in very difficult performance situations.

3 There is evidence for the possibility of intellectual progression in adulthood and old age.

4 With age, the structure of life goals is changed such that the acquisition and maintenance of school-related cognitive skills becomes deemphasized and replaced by an accentuation of realms of functioning that are important for coping with life.

5 Adult intellectual development is characterized by increasing individualization and interindividual differentiation. The maintenance, growth, and decline in select domains of intellectual functioning is regulated by both external resources and internal performance conditions.

6 Aging in many countries is primarily associated with a social-structural process of loss of development-enhancing expectations and social resources. This process, however, may not occur in areas of specialization.

7 From a biological point of view, normal aging is associated with increased vulnerability and reduced adaptability to maximun levels of functioning.

8 The biological status of aging individuals is not a totally fixed phenomenon. There are modifiable features both in terms of the individual life course and in terms of evolution.

Note. The propositions are summarized from Baltes et al. (1984).

The first proposition (stability of an individual's normal-range intellectual potential) refers to the argument concerning cross-sectional versus longitudinal evidence on intellectual development. The second proposition (decline in abilities involving maximum performance) is a conclusion drawn from evidence provided by training studies (disuse hypothesis), especially those working with the testing-the-limits paradigm. Proposition three (possibility of growth-like changes) refers to multidimensional and multidirectional conceptions of intelligence. Together with propositions four (age-related change in life goal structure) and five (individual specialization), proposition three refers to the ecological validity argument.

Finally, propositions six (social structure of the life course) through eight (increased vulnerability of biological functioning; modifiability and optimization of biological reserve) take into consideration the sociological and biological influences on intellectual development which is characteristic of a contextual approach to human development (Lerner, 1986). Development (decline, stability, growth) is regulated jointly, by heredity, by the environment, and by individual choice. What happens on one level of analysis (biological, social, psychological) systematically influences what happens on the others.

The eight propositions serve as the basis for a model of intellectual aging, called "selective optimization with compensation" (Baltes & Baltes, 1980; Baltes & Willis, 1982). The model of selective optimization with compensation is of interest to the present work as it is specifically applicable to the study of stability and growth in intellectual functioning. The model assumes that intellectual aging displays features of decline, stability, and growth. It suggests that the process of "successful aging" may be typified by the individual's own aptitude in "selecting" life goals and trajectories for which internal and external conditions are supportive. As long as this support is present, intellectual skills and domains of expertise may be maintained and, more important, may compensate for those realms that are not supported.

The Dual-Process of Intellectual Development

In a first application of "selective optimization with compensation" to life-span development of intellectual functioning, Baltes, Dittmann-Kohli, and Dixon (1984) have in a discriptive manner distinguished between the context and function (pragmatics) of intelligence and its basic cognitive operations (mechanics). Two intellectual processes were juxtaposed: the mechanics and the pragmatics of intelligence.

The Mechanics of Intelligence

According to Baltes et al. (1984), the "mechanics of intelligence" comprise the basic cognitive architecture of information processing and problem solving. The basic cognitive operations and cognitive structures involved are perceiving relations and logical reasoning. On both one might expect age-related decline. The notion of the "mechanics of intelligence" parallels the concept of fluid intelligence which is one of the central dimensions in Cattell's model of intelligence. Being aware of the discussion about domain specificity versus domain generality of cognitive structures and operations (e.g., Keil, 1981), the authors postulated the "mechanics of intelligence" to be content-free in the sense of an ideal type (Weber, 1964). Thereby indicating that the separation of the two components, mechanics and pragmatics, is to be understood as a heuristic device for advancing the study of the phenomenon rather than as two mutually exclusive categories.

The Pragmatics of Intelligence

The second process in the model formulated by Baltes and his colleagues is conceptualized as the "pragmatics of intelligence" and refers to the content and knowledge-based elaboration of intelligent behavior. A pragmatist's view on intelligence attends to the efficaciousness of reason in applying prior experience and knowledge to manage "practical predicament of life" (Thayer, 1952, p. 33). This view broadens the concept of intelligence to include not only psychometric intelligence, practical intelligence, logical reasoning, but also judgement, common sense, insight, deliberation, and wisdom. In a similar way, Sternberg argued for the expansion of the concept of intelligence (Sternberg, 1985c) to bring into focus the adaptive use of intellectual functioning.

The "pragmatics of intelligence" subsume relatively generalized and automatized knowledge systems, such as crystallized intelligence (e.g., language, general knowledge). Furthermore, however, they include as a result of the process of specialization specific knowledge systems (e.g., professional domain, leisure activity, family life). Both kinds of knowledge systems, general and specific ones, are composed of a declarative and a procedural part. The hypothesis is that certain facets of the "pragmatics of intelligence" might show life-long progression or at least stability.

The mechanics of intelligence are related to primarily domain-general operations. The pragmatics of intelligence are conceptualized in terms of knowledge systems of rather specific content. No assumptions are made, however, concerning the domain specificity or domain generality of the procedural components of respective knowledge systems.

The issue of domain generality versus domain specificity can also be related to the recurring discussion of the relationship between structure and function, as well as between structure and content. With regard to this discussion, the Neo-Piagetian work on adult intelligence (e.g., Commons et al., 1984; Labouvie-Vief, 1982), introduced above, assumes structural change in adulthood. Similarly, Perlmutter (1988) in her three-tier model of cognitive development, separated higher-level procedural skills (third tier) from crystallized abilities (second tier). Thus, beyond the specialization in different content domains—without, however, explicitly introducing the notion of knowledge systems—she assumed structural change in adulthood by means of the domain-general third tier.

In the dual-process model which for the pragmatics of intelligence capitalized on the notion of knowledge systems, higher-order procedural skills are evolving in the process of acquiring expertise in a certain knowledge domain. One characteristic of an expertise are, in fact, such refined higher-level procedural skills that monitor performance on tasks related to the given knowledge domain. Further research may show the generality of such procedural knowledge or of some elements of it. So far, however, there is no clear empirical evidence as to the generality of such higher-level procedural skills. It is, for example, an open question whether and by which mechanisms professional expertise transfers to the management of life problems (e.g., Featherman, 1980).

Acquisition of expertise(s) in certain facets of the pragmatics of intelligence may under certain conditions of internal and external support allow for compensation of decline in the mechanics of intelligence (selective optimization with compensation; Baltes & Baltes, 1980). In a similar vein, Rybash et al. (1986), as reported above, have proposed that the encapsulation of mental resources in specific domains of knowledge provided the possibility to compensate for the reduced ability to acquire new knowledge. In the following section wisdom will be discussed as one such facet of the pragmatics of intelligence which under certain conditions of internal and external support may show as a prototype of life-long growth in the pragmatics of intelligence.

Wisdom as a Prototype of Potential Growth in Adult Intellectual Functioning

Several research areas to study the potential for stability and growth in adult intellectual functioning are discussed in the literature, such as professional specialization and productivity (e.g., Bertram, 1981; Birren, 1969; Featherman, 1980; Kohn & Schooler, 1978), practical and social intelligence (e.g., Cantor & Kihlstrom, 1987; Sternberg & Wagner, 1986), and wisdom. In the present work, the study of wisdom is chosen as a focus of interest and will be presented below as an example for the application of the life-span perspective on intellectual development, more specifically of the aging principle "selective optimization with compensation."

Wisdom as a Theoretical Concept

During the recent decade, the topic of wisdom has attracted increasing interest as an example of what has been labelled the pragmatics of intelligence, or as a prototype of advanced adult thinking and knowledge (e.g., Baltes et al., 1984; Clayton & Birren, 1980; Dittmann-Kohli & Baltes, in press; Holliday & Chandler, 1986; Kekes, 1983; Meacham, 1983; Sowarka, 1987; Sternberg, 1985b). Wisdom, however, has been a topic of interest for various domains (ranging from philosophy and religion to fairy tales and folklore) at all times and in many different cultures.

Philosophical, Religious, and Secular Accounts of Wisdom

According to Bryce (1979), the oldest Western wisdom literature came from Egypt and centered around the difficulty of maintaining faith when confronted with the injustices and paradoxes of life. In Greek and Roman philosophy, for example, Aristotle and

Plato stressed the intellectual aspects of wisdom whereas Cicero and Seneca considered wisdom a moral rather than an intellectual virtue (see Collins, 1962; Rice, 1958).

In a recent philosophical account of wisdom, Kekes (1983) combined such moral and intellectual aspects by describing wisdom as interpretive knowledge, that is knowledge about good means to good ends. Although Kekes has written according to a philosophical tradition, he used terms that very much resemble the above presented notion of expertise. He, thus, related accurate interpretation to a combination of "breadth" and "depth." His notion of breadth can be interpreted in terms of a relativistic and contextualistic point of view; and his notion of depth can be described as knowledge about the fundamental themes of human existence (e. g., death, illnesses, emotions) as well as the ability to set priorities of commitment. Kekes claimed that wisdom becomes visible through good judgement in what he called hard cases.

In Eastern philosophy and religion two thousand years ago, Confucius described wisdom as being able to follow what the heart desired, without transgressing what was right (see de Beauvoir, 1972). In this seemingly simple statement one very important feature of wisdom is encoded, that is the integration of emotion, cognition, and moral.

Finally, the theme of worldly wisdom can be found in fairy tales. In an analysis of this topic, Chinen (1987) arrived at two main aspects of worldly wisdom as it is implied in a number of fairy tales. The first aspect referred to insights about human nature, and the second to a transcendence of the self and a generative attitude.

Theoretical Concepts of Wisdom in Psychology

In psychology also, there is at least some history to the interest in wisdom. Hall (1922) associated wisdom with late adulthood and the emergence of a meditative attitude, philosophic calmness, impartiality, and the desire to draw moral lessons. He, in fact, described the tendency to draw moral lessons as a task of old age, and the urge to sum up and keep perspective as a function of old age. His ideas about old age and wisdom have been taken up in recent work on adult development (e. g., Brent, 1978; Labouvie-Vief, 1982; Mergler & Goldstein, 1983; Toulmin, 1981) and can be employed to illustrate the principle "selective optimization with compensation" (Baltes & Baltes, 1980; Baltes et al., 1984). Consider, for example, Hall's following description of the wisdom of age. "As the eye dims and the dominance of optical impressions over attention declines, we see ideas clearer and follow the associations of thought rather than those of the external world." (1922, p. 403)

Translating this statement in the life-span terminology, introduced above, would suggest that old people may select their accumulated experiences and knowledge as a domain of optimization and thus compensate for the reduced capacity of their senses. In fact, the reduced sensory capacity may be a precondition for the optimization of accumulated experiences and knowledge.

Jung (1971), in his writings, talked about the archetype of the old wise person which is part of our collective unconscious and which can be found in fairy tales and folklore. This part of the collective unconscious, according to Jung, dates back to illiterate societies where social continuity was maintained by oral tradition, primarily provided by tribal elders. As part of the collective unconscious, Jung claimed that wisdom is timeless. Jung stressed that old age has a significance of its own. It is not only the "appendage to life mornings" (1971, p. 17). In order to realize this significance, however, the aging individual has to transform his/her psychic structure from being externally to being internally oriented. Only when an individual has come in touch again with the collective unconscious, Jung claimed, has he/she the possibility to attain wisdom.

Erikson (1959) added a personality perspective to this general psychological approach. According to his model, human development can either culminate in the attainment of wisdom or end with despair depending on how successfully the final task of integrating one's life is resolved by the individual. Erikson characterized the attainment of wisdom by features such as richness of knowledge, insight, and maturity of judgement. An integrated old person, according to Erikson, acknowledges the historical relativity of life, recognizes younger generations' need for participation in societal responsibility, and thinks about the paradoxes of life.

In his considerations concerning wisdom and the context of knowledge, Meacham (1983) characterized a wise person as someone who knows that he/she does not know (i.e., with increasing knowledge also the insight into all possible knowledge increases). Consequently, a wise person will in situations of decision-making always look for further information and alternative solutions. For Meacham, wisdom implied the ability to recognize and formulate problems. Similar characteristics were mentioned when discussing above features of the mature thinker (see Arlin, 1984). Meacham concluded by stressing that a wise person is able to balance knowledge and doubt. Although it seems as if Meacham is stressing the intellectual dimensions of wisdom, the balancing of knowledge and doubt implies an integration of cognitive and emotional processes.

The Study of Implicit Theories About Wisdom

More recently, a number of empirical studies concerning implicit theories of wisdom have been conducted (e.g., Brent & Watson, 1980; Clayton, 1976; Holliday & Chandler, 1986; Sowarka, 1987; Sternberg, 1985b). One important finding of all these studies was that the concept of wisdom and of a wise person could be identified in everyday language. The following prototypical characteristics of a wise person were proposed by such studies. Clayton (1976) identified affective (empathy, compassion), reflective (intuition, introspection), and cognitive (experienced, intelligent) dimensions as prototypical features of a wise person. Compared to Clayton's results (1976), Sternberg's dimensions of wisdom lack the explicit affective component but judgemental abilities are added. Holliday and Chandler (1986) identified in a prototype analysis two central dimensions of wisdom. One dimension they called "exceptional understanding of ordinary experience" which combines qualities of the mind with practical virtues of leading a good life. The other central feature of wisdom was "judgement and communication skills" which referred to qualities like comprehending, weighing consequences, and giving good advice.

Clayton (1982) and Clayton and Birren (1980) have extended the empirically gained conception of wisdom by some theoretical considerations. They referred to Erikson's theory of life-span development and to models of post-formal operational thought as well as to studies of lay conceptions. Achieving a sense of meaning in one's life in the face of death as well as awareness and management of the contradictory, and non-logical aspects of reality are included in their definition of wisdom, besides the above mentioned cognitive, reflective, and affective dimensions.

Summary

This survey of theoretical and empirical approaches to the concept of wisdom is concluded by summarizing its main features. It seems that the integration of cognitive-reflective, emotional, and ethical aspects should be at the heart of a conceptualization of wisdom and distinguish wisdom from, for example, social intelligence or practical intelligence. As pointed out, the theoretical approaches discussed above vary in the emphasis they put on each of these aspects. Wisdom is not only rich knowledge about the human condition, about people, about situations, about oneself. Wisdom also includes an interpretation and evaluation of that knowledge and it finally comprises the awareness and management of the limitations of that knowledge. In most of the theoretical conceptions, presented above, wisdom is related to late adulthood. Wisdom *can* be acquired with time, with the accumulation of experience. It is questionable, however, whether wisdom can be learned or taught.

Two Empirical Approaches to Wisdom

After reviewing various theoretical conceptions and implicit theories of wisdom, we move on to discuss some of the rare empirical attempts to approach wisdom as a human characteristic that may develop over the life span.

One empirical approach described wisdom as the highest form of five stages of religious reasoning (Oser, Althof, & Bucher, 1986). In an initial study, wisdom was accessed by half-structured interviews with religious people of various confessions (Protestants, Roman Catholics, Hindus, Atheists). The interviews concerned the meaning of critical life incidents and were later content analyzed using the stages of religious reasoning as categories. The following components of the concept of wisdom were delineated: liberating oneself from authorities and developing own values (autonomy); tolerance; giving meaning to life; commitment to mankind; certainty and readiness to doubt. The moral, ethical, and paradoxical aspects are central to this notion of wisdom. The author concluded that "there can be no such thing as a curriculum for wisdom" (p. 11). Each of their participants had lead his/her own particular way of life. Wisdom, in the sense of personal maturity and autonomy, can be an outcome of each individual's coping with his/her life. What can be done, however, is to "support people in making their own sense out of their life" (p. 11).

Another empirical approach to wisdom has been launched under the heading of social intelligence. Cantor and Kihlstrom (1987) tried to bring together research on personality with research on intelligence. They used life tasks (in the sense of developmental tasks; Havighurst, 1948) as measures of social intelligence. Cantor and Kihlstrom argued that individuals with a high degree of social intelligence deal wisely with such tasks. Social intelligence is defined very broadly as that portion of intelligence which a person brings to bear in solving his/her personal life tasks.

Cantor and Kihlstrom applied the expertise paradigm to further analyze social intelligence. They distinguished between declarative and procedural knowledge in the domains of social concepts and rules, and of the self. The declarative knowledge of the social realm consists of knowledge about people (how are others described and interpreted), about situations (physical setting, behavioral setting, social norms), and episodes (stereotypical social episodes, e.g., coping with loss or luck). Declarative knowledge about the self refers to characteristics of the self and narrative memories. The procedural part consists of rules for self-reflection, such as self-inference and self-evaluation. Expertise in declarative knowledge, that is the amount and organization of knowledge is distinguished from expertise in procedural knowledge which refers to the utilization of meta-rules for problem definition, problem solution, and problem evaluation. Cantor and Kihlstrom talked about wisdom in the context of successful coping with life tasks. Thus, they emphasized the association of wisdom with an individual's action or life style. In a study on the life task "transition to college," Cantor, Niedenthal, and Brower (1985) found that students did quite well in working towards their life task goals. However, it remains an open question, the authors claimed, whether such students will be able not to become trapped by their own expertise. Cantor and his colleagues stressed the flexibility of coping behavior as a critical feature of wisdom.

Wisdom Within a Life-Span Approach to the Development of Intellectual Functioning

In the following section, I will focus on the life-span research on wisdom which also provides the framework for the present empirical study. Baltes and his colleagues (1984; Baltes, Smith, Staudinger, & Sowarka, in press; Dittmann-Kohli & Baltes, in press; Dixon et al., 1986; Smith, Dixon, & Baltes, in press) have suggested wisdom as an expertise in the knowledge domain "fundamental pragmatics of life" as one analog to study the potential for stability and growth of intellectual functioning in adulthood and old age.

How is Wisdom Defined?

In their theoretical analysis of wisdom, Dittmann-Kohli and Baltes (in press) started from an everyday definition of wisdom as a mental capacity indexing "good judgement about important but uncertain matters of life." For further theoretical and empirical work, wisdom has been more specifically conceptualized as expertise in the knowledge domain "fundamental pragmatics of life." This conceptualization combines method and concepts of cognitive psychology, and the study of knowledge systems (e.g., Newell & Simon, 1972; Brown, 1982) with the life-span perspective (Baltes, 1987).

The knowledge domain "fundamental pragmatics of life" refers to knowledge about the principles of the human condition and its development over the life span, to strategies that organize our knowledge of life-span development, and to decision strategies dealing with judgement about the past, present, and future of life. In its central components, it consists of knowledge about how human beings move through life, about possible variations in the life course and their conditions, and about problems that might arise as well as possible solutions. It is assumed that in the domain "fundamental pragmatics of life" knowledge may, under certain conditions of internal and external support, accumulate over the life span.

Related to the everyday relevance of the knowledge domain "fundamental pragmatics of life" is its ill-definition. It is an open system of knowledge, and not a delimited body of knowledge. There is no objective yardstick against which to measure the correctness or quality of knowledge in such an ill-defined domain (e. g., Simon, 1973). In addition, knowledge about fundamental life pragmatics seems to have the character of tacitness, as proposed by Sternberg and Wagner (1986) for knowledge in professional settings (see p. 50 above). Usually, tacit knowledge is not explicitly expressed or stated. No specific curriculum exists that could be used to teach knowledge about fundamental life pragmatics. However, various sources can be employed to derive knowledge (procedural and declarative) about the fundamental pragmatics of life. One can try to enhance and develop this body of knowledge, for example, through the study of historical documents or selected works of the behavioral sciences, through attention to social rules in our society (as presented, e. g., in the mass media), through conversations with peers and older persons, or by reflection about one's own life experiences.

Is any Amount and Quality of Knowledge in the Domain "Fundamental Pragmatics of Life" Considered to Indicate Wisdom?

In the Berlin model, wisdom is confined to a high level of knowledge in the domain "fundamental pragmatics of life." Therefore, wisdom has been characterized as an expertise in this knowledge domain (Baltes & Smith, 1987).

At levels of expertise, the factual knowledge in the domain "fundamental pragmatics of life" is rich in terms of amount (i. e., the scope of information presented), and quality (i. e., information is organized around basic themes of human existence). Furthermore, the factual knowledge base is postulated to include an understanding of the contextualistic, relativistic, and uncertain qualities of life matters. Knowledge of facts is associated with a repertoire of strategies for its use in relation to the development of the self or in discourse about life matters (e. g., life planning, life review, life management). At a general level, these strategies include the ability to deal with uncertainty, to set priorities, to consider long-term consequences of decisions, and to select and integrate means and ends. More specifically, these strategies are combined and adapted for use in the processes of life planning, life review, and life management. As the term "expertise" may convey the impression that wisdom is exclusively considered a cognitive phenomenon, I want to clarify that an integration of cognitive, affective, and ethical aspects of wisdom into a coherent body of high-level quality of knowledge about the fundamental pragmatics of life is at the heart of this wisdom concept.

What are the more Specific Criteria of Wisdom?

Several lines of research, presented in the preceding part of this chapter, have informed the definition of specific criteria qualifying wisdom as an expertise in the knowledge domain "fundamental pragmatics of life": philosophical and psychological work on the concept of wisdom (e.g., Clayton & Birren, 1980; Hall, 1922; Holliday & Chandler, 1986; Jung, 1971; Kekes, 1983; Meacham, 1983; Sternberg, 1985b), work on the development of expertise (e.g., Chi et al., 1982; Larkin et al., 1980), and research on the specific characteristics of adult thought (e.g., Commons et al., 1984; Dörner et al., 1983; Labouvie-Vief, 1982; Sternberg & Wagner, 1986).

A family of five criteria further characterizes wisdom as an expertise in the knowledge domain "fundamental pragmatics of life" (Baltes & Smith, 1987):

"1. Global evaluation of the quality of *advice* and *judgement* and/or commentary offered in the context of life planning, life management, and life review. 'Good' advice, 'good judgement' and/or 'insightful' commentary—as defined by social consensus—indicate high-level functioning.

2. *Rich factual and procedural knowledge* (about the fundamental pragmatics of life) in terms of scope (or amount) and organization (quality and/or depth) of information used in the approach to and discussion of problems concerning life review, life management, and life planning.

3. *Life-span contextualism* involves an awareness that life development is embedded in multiple contexts and that these contexts are inter-related. The multiplicity of contexts refers to time (past, present, and future) as well as variety of life domains. Moreover, contextualism posits that these contexts are not always coordinated but can involve tension and conflict. During ontogeny, the system of contexts changes, including their relative positions in terms of importance.
   High-level contextualistic knowledge about fundamental life pragmatics will involve (a) knowledge of the possible set of contexts relevant to the problem, (b) knowledge of ontogenetic relationships, (c) knowledge about tensions between contexts, and (d) knowledge about life-span changes in relative importance.
   One procedural implication of contextualism is that expert-level functioning may include a broad contextual analysis followed, however, by a limited specification for the problem at stake. Thus, only knowledge about ontogenetic sequencing and priority may be evident in a protocol.

4. *Relativism* involves an awareness that all judgements are a function of, and are relative to, a given cultural and personal value system. High-level performance will include some statement of this fact together with procedural strategies of dealing with it. For example, attempts to imagine alternative problem definitions and solutions, to empathize with the values attributed to the individuals involved in the problem and to maintain a certain personal detachment from the problem would be indicators.

5. *Uncertainty* involves an awareness, that no analysis of a life problem can be complete and that life problems do not have perfect solutions: The future is

not fully predictable and all aspects of the past and present cannot be known. Nevertheless, there are strategies for dealing with uncertainty. An expert would focus on these."

How is Wisdom Expected to Develop?

Anderson's model of skill acquisition, as described above, is applied to the "microgenetic" development of expertise in the domain "fundamental life pragmatics." This model implies that development proceeds from the acquisition of basic facts and procedures, through an integration of facts and procedures and the evolvement of effective strategies to the final fine-tuning of the system. Thus, depending on an individual's position within the acquisition process of expertise in the domain "fundamental pragmatics of life," high levels of functioning may first be confined to the two rather general wisdom criteria, good advice and judgement and rich factual and procedural knowledge, and only later also include the other three, more wisdom-specific and elaborate indicators, life-span contextualism, relativism, and uncertainty.

The contextualistic approach to development characteristic of the life-span perspective, suggests that individual differences in the level of expertise attained in a domain result from genetic differences in the mechanics of intelligence, cultural learning, socio-cultural differences, and ideosyncratic life biographies. Elaborating on the notion of interindividual variability, this approach implies that having moved further through life may result in higher levels of expertise but need not necessarily do so.

Therefore, chronological age is but one predictor for an individual's level of expertise in the knowledge domain "fundamental pragmatics of life." Chronological age has to be explicated and supplemented, for example, by cognitive variables, personality and motivational variables, and life experiences. Expertise in the fundamental pragmatics of life may also be confined to certain subdomains within the large field of knowledge about life (e.g., family relations, raising children, health).

How can we Empirically Gain Access to Wisdom as an Expertise in the Knowledge Domain "Fundamental Pragmatics of Life"?

For the empirical analysis of wisdom-related knowledge three topics of discourse about life have been singled out (Baltes et al., 1984): life planning, life management, and life review. All three topics have the potential to be relevant and ecologically valid across the whole life span.

A first study elicited wisdom-related knowledge in the context of tasks involving life planning (Smith et al., in press). The present study has focused on life review as a topic of discourse about the fundamental pragmatics of life. Life review, as procedure and as product, will be discussed in the next chapter. Together with Chapter 2 (intellectual development across the life span), Chapter 3 (life review) provides the basis from which design and procedure of the present study are derived.

Chapter 3

Life Review: Theoretical Perspectives and Empirical Evidence

According to the presented theoretical scenario about the concept of wisdom as expertise in the domain "fundamental pragmatics of life," life review represents one kind of discourse about this domain. As life review will be the substantial focus of the empirical part of this work, related research on life review—aside from its direct relevance for the study of wisdom—will be presented in the next section. The summary of literature on life review will try to answer the following questions: Is life review an age-related process? What are the functions and triggers of life review? Which are the crucial personality and cognitive variables that may contribute to individual differences in life review? The presentation of such theoretical perspectives and empirical evidence on life review is preceded by some terminological considerations.

The Distinction Between Life Review, Reminiscence, and Autobiographical Memory

When discussing the issue of life review, it seems useful to clarify and to distinguish between three terms that have been variously applied to the phenomenon in which an individual reflects about his/her life: life review, reminiscence, and autobiographical memory. The inconsistent and imprecise use of terminology throughout most of the theory and research on life review is quite striking.

In empirical research, the term "life review" has primarily been used in two ways. First, some researchers use the term "life review" synonymously with "reminiscence" without any further discrimination and, often, do not provide a clear definition of either (e.g., Lieberman & Falk, 1971; Revere & Tobin, 1981). Examples of phrases used to describe reminiscence as well as life review include: "dwelling on the past" (Havighurst & Glasser, 1972), "turning one's attention to the past" (Romaniuk & Romaniuk, 1983), or "events referring to the past" (Lewis, 1971).

Second, other researchers have differentiated types of reminiscence. McMahon and Rhudnick (1964), for example, distinguished between (a) story-telling reminiscence which enhanced the story-teller's self-esteem or transmitted the cultural heritage; (b) reminiscence that provided material for life review, and (c) defensive reminiscence which alleviated anxiety. Coleman (1974) talked about simple reminiscence (i.e., recalling the past); informative reminiscence (i.e., entertainment or lecture for younger listeners), and life review, which he reserved for instances where memories were analyzed to integrate a proper self image. Finally, LoGerfo (1981) like McMahon and Rhudnick (1964), differentiated between informative reminiscence, evaluative reminiscence (or life review), and obsessive reminiscence.

On close inspection, it becomes evident that the classifications of McMahon and Rhudnick (1964), Coleman (1974), and LoGerfo (1981) mixed two aspects of differentiation, that is (a) the components of the procedure and (b) the function of the phenomenon. The classifications mostly start out by differentiating according to function (e.g., well-being, providing information, alleying anxiety) and then sometimes in a non-systematic way bring in the procedural components (e.g., retrieval from memory, analyses of memories).

For present purposes, it is suggested to first distinguish according to procedural aspects. Thus, two procedures are differentiated. Reminiscence is defined as recalling life events, and life review is conceptualized as recalling life events plus analysis (interpretation and evaluation) of recalled events. In a second step, various functions can be associated with either of the two procedures, reminiscence and life review. Functions could involve, for example, pleasure of telling, oral history, alleying anxiety for reminiscence; and teaching others, enhancing self-understanding, or dealing with a problem for life review.

Reminiscence and life review are further differentiated by the degree of intentionality associated with either phenomenon. Reminiscence, on the one hand, can be triggered quite unwillingly on behalf of the reminiscer, just by listening to a piece of music or by looking at an old photograph. Life review, on the other hand, asks for more active engagement of the person who is reviewing his/her life. The additional procedural components of interpretation and evaluation, characterizing life review, make it necessary to actively engage in analyses of the recalled material and result in cognitive restructuring of the memories.

The differentiation between reminiscence and life review presented so far is somewhat oversimplified when one takes the results of an information processing approach to memory into account (e.g., Lindsay & Norman, 1972). What is the relation between retrieval from autobiographical memory or longterm memory in general and life review? Notions like "recall" or "retrieval from memory" may convey the impression that remembering means to "pick up" events stored in memory. According to empirical evidence, however, especially concerning memory for events and even more so for autobiographical material (Kolodener, 1985; Neisser, 1982; Reiser, Black, & Abelson, 1985), retrieval is considered a problem-solving process in itself. A problem-solving process during which stored information is selected, manipulated, and reorganized. The final product of this process is the recalled (reconstructed) event. At this micro-level of analysis, it is quite obvious that the distinction between reminiscence and life review is not one of "no further" analysis versus "further" analysis of memories. Rather, the distinction is a matter of the extent of further analysis and possibly of the degree of intentionality of such analyses. Therefore, a more refined differentiation is suggested. Reminiscence is defined as reconstructing life events from memory, and life review is conceptualized as reconstructing life events from memory plus further analysis (interpretation, evaluation) of the reconstructed material.

Along this line of distinction, Strube and Weinert (1987) offered various perspectives on autobiographical memory. On the one hand, autobiographical knowledge can be considered one knowledge domain in memory among many others which would be analogous to reminiscence, as defined here. On the other hand, however, Strube and

Weinert pointed to the relation between autobiographical knowledge and autobiography and to autobiographical knowledge as a basis for the experience of personal identity which would be similar to the here presented definition of life review.

The distinction offered here between reminiscence and life review is similar to that made by Butler (e.g., 1963). For Butler (1963, p. 67) "life review is not synonymous with, but includes reminiscence." In his approach Butler focused on the therapeutic function of life review to deal with the growing awareness of approaching death. Through the reconsideration of past experiences and their meaning, the individual may be able to reach a revised understanding of the past and a substantial reorganization of personality may occur. One intention of the present review is to argue that the terms, reminiscence and life review, should no longer be used synonymously and that greater care should be spent in interpreting and designing studies that capture one or the other meaning.

Theoretical Perspectives on Life Review

Life Review as Procedure and as Product

Life review is a product; it is the retrospectively reconstructed biography of an individual. In other words, it represents an individual's knowledge about his/her life. At the same time, life review is a procedure that accesses and constructs this knowledge. This procedure involves autobiographical retrieval as well as processes such as categorization, grouping, or relating memories to certain theoretical concepts. The specification of such components that constitute the procedure of life review illustrates that life review as a product, either in written or in oral form, either as biography or as autobiography, is not an exact record of a life but rather a retrospectively reconstructed and interpreted record. Content and emotional slant of a produced life review will vary, for example, according to the individual's present attitudes and motivational states.

Life review as a product has been widely used as both a data source and as an object of study in itself (Staudinger, 1984). The interest in life histories as a resource of knowledge about the past has a long tradition dating back to the Greeks. It is claimed that Herodotus was the "inventor" of oral history (Butler, 1981). Dilthey (1968) and Goethe (1971) proposed that an individual's life history provided material that can further the understanding of how an individual's development is influenced by the interdependencies between person and environment.

Almost all social or cultural sciences have shown and/or are showing interest in the human life course as it is represented in an individual's life review (e.g., Fuchs, 1984; Runyan, 1982; Sørensen, Weinert, & Sherrod, 1987; Thomae, 1952). Historians, for example, collect oral histories about historical events. Their interest has been primarily in individuals' knowledge and interpretation of a certain historical time. The individual who has experienced certain events is employed as a data source for historical theorizing (Niethammer, 1980; Thompson, 1978). Similarly, sociologists and cultural anthropologists are interested in how social and cultural conditions affect individual life courses (Bertaux & Kohli, 1984; Elder, 1985; Kertzer & Keith, 1983; Kluckhohn, 1945). As life reviews became more and more an important data source for the social sciences, the reliability of such life histories has become a central research issue (Bromley, 1986). In this respect, the analysis of the linguistic structure of solicited life narratives is one attempt to distinguish between "actual" events and additions on behalf of the specific situation or the individual's present frame of mind (Schütze, 1984).

In psychology, life review has been of interest as a product and as a procedure. This is evident, for example, in clinical psychology, especially within the psychoanalytic tradition. On the one hand, life review (product) is considered a diagnostical means for the therapist and on the other hand contributes a client's reviewing of his/her life (procedure) to the therapeutical process. For certain early psychologists interested in the development of personality throughout the life span (e.g., Allport, 1937; Bühler, 1933; Murray, 1938; Thomae, 1955), life review has been of central importance to gain insight into the human life course. Life histories formed the bases of their personality theories. More recently, cognitive psychologists developed interest in the memory processes associated with the procedure of life review (Rubin, 1986; Strube & Weinert, 1987). Another line of inquiry deals with the life-span development of a person's tendency to engage in life review which then is investigated in terms of an individual's time perspective (e.g., Kastenbaum, 1977).

Life Review Within Selected Theories of Life-Span Development[1]

Timing and Frequency of Life Review

There seems to be the general expectation, that middle to later adulthood is the period during which people most likely engage in life review (Butler, 1963; Erikson, 1959; Jung, 1971; Neugarten, 1968). A closer look at such theoretical formulations, however, suggests that people may engage in life review throughout the life course. In the following section, various life-span developmental theories will be reviewed concerning their statements on the timing and the frequency of life review.

In Jung's theory, the occurrence of life review is associated with the beginning of the second half of life. The following ideas underlie this position. Development, for Jung (1971), involved the gradual differentiation and integration of personality characteristics. During the first half of life (until age 35 to 40), Jung claimed that the individual is concerned with determining and developing the personality type that will best enable adaptation to environmental demands. Beginning with the second half of life, the individual's orientation undergoes a change. The self and its needs draw the attention inward. This shift might give rise to tension and imbalance within the psychic system, especially if the person is attempting to carry the "psychology of the youthful phase"

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[1] In the following paragraphs, a selection of theories of life-span development are discussed with respect to their views on the phenomenon which here has been defined as life review (see p. 71). The term "life review" is not necessarily used by the respective authors.

(Jung, 1971, p. 14) into these middle years. Psychic tension, according to Jung, shows itself in a sense of dissatisfaction about life. According to Jung, life review primarily occurs at this turning point from the first to the second half of life.

Within Erikson's epigenetic theory of psycho-social development (Erikson, 1959, 1963), life review seems at first sight primarily related to the end of a life course. He distinguished eight "ages of life"[2] (life tasks) which represent critical, age-specific challenges that have to be successfully mastered for the individual to develop optimally. According to Erikson, psycho-social development denotes growth and change in the individual as both person and society evolve. The last of Erikson's eight life tasks (integrity versus despair) is specifically related to a complete life review. This last task is usually linked to old age. It has to be considered, however, that Erikson has a notion of stage that implies that stage-related phenomena such as the life tasks and the means to solve the tasks only have relative predominance at a specific age and are also present at the other stages.

Applying this notion of stage to life review as a means to cope with the final life task, it is suggested here that in principle Erikson's theory provides the possibility for life review to also occur at earlier stages of the life course. Naturally, at earlier stages of the life course correspondingly shorter time periods are reviewed. Also, it may be a not as widely (interindividually) and as often (intraindividually) observed phenomenon as it seems to be at later stages in life.

The more empirically based theories of life-span development of Bühler and Neugarten have, like Jung, also identified midlife as the most likely time for a person to engage in life review. Bühler (1933; Bühler & Massarik, 1968) characterized psychological development as a process of gradual expansion, culmination, and finally contraction. According to her theory, the end of the third stage of the life cycle (about age 45) marks the realization of personal goals and signals a turning point in life. Like Jung, Bühler saw the fourth stage (age 45 to 65) as marked by the awareness of decline and a concommitant shift in priorities from external to internal matters. With the beginning of the last stage (after age 65), the process of reviewing one's life should be completed and result in a sense of fulfillment or failure.

For Neugarten (1968), too, life review and re-assessment play a vital part in middle age. She did not, however, conceptualize this period to be necessarily a time of crisis. Rather, she viewed it as a time of gradual restructuring of life "in terms of time-left-to-live rather than time-since-birth" (Neugarten, 1968, p. 97). Apart from the reconceptualization of time, new perceptions of the self and of death evolve also. In general, Neugarten suggested that there is no overarching plan to adult development, but rather the passing of development is structured by age norms rooted in culture and society. Crises may result, however, from a deviation of the individual life course in terms of being "off time" with certain life events. According to Neugarten, beginning with the middle part of life, chronological age is no longer a meaningful marker. Instead, individuals "clock" themselves along social and psychological dimensions (Neugarten, 1968, p. 94). Although Neugarten did not draw this conclusion, one might argue that rather than being fixed to midlife, reflections upon life and self-evaluation (i.e., life review) are related to realizations of being "off time."

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[2] Erikson (1963) distinguishes the following eight life tasks (and emerging ego skills) as characterizing human life-span development: (1) basic trust versus mistrust (hope); (2) autonomy versus shame and doubt (will); (3) initiative versus guilt (purpose); (4) industry versus inferiority (competence); (5) identity versus identity confusion (fidelity); (6) intimacy versus isolation (love); (7) generativity versus stagnation (care); (8) integrity versus despair (wisdom).

Unique to Levinson's formulations (1978, 1986) is that they can be interpreted as providing the possibility for life review to occur throughout the life cycle. Although Levinson does not explicitly use the term "life review," his description of the examination and assessment of the life structure seems to involve what is called here "reviewing one's life."

Levinson conceptualized life-span development as alternation between stable stages and transitional periods. "I conceive of the life cycle as a sequence of eras ... A cross-era transition ... terminates the outgoing era and initiates the next." (1986, p. 5) Developmental stages or eras are characterized by varying life structures. Levinson defined life structure as the underlying pattern or design of a person's life at a given time. This pattern or design consists of a person's relationships with various others (e.g., persons, groups, institutions, objects, places). In transitional periods, a person critically examines his/her life structure by asking questions like: Am I satisfied with my life? Am I

Table 3: Life Review within Selected Theories of Life-Span Development

		Notion of Life Review		
Life-Span Theorists	Notion of Development	Timing	Trigger	Function
E. M. Erikson	Continuous growth through confrontation with and solution of life tasks	Old age (relative prevalence)	Life task: integrity vs. despair; awareness of finitude of life	Evolving wisdom through maintaining integrity despite decline
C. G. Jung	Gradual differentiation and integration of the self	Second half of life (40 yrs.)	Shift in attention orientation from environment to self	Restoration of psychic balance
C. Buhler	Expansion–Culmination–Contraction	Second half of life (45 yrs.)	Realization of turning point in life; awareness of decline	Restoration of balance through self-assessment; conclude with a sense of fulfillment or failure
B. Neugarten	Determination through social norms (especially in adulthood)	Second half of life	Restructuring of life time: "time-since-birth" ⇒ "time-left-to-live"	Coping with death; Re-assessment of life
D. J. Levinson	Alternation of stable phases and transitions	Early adulthood Middle adulthood Late adulthood	Life transition characterized by critical reappraisal of life structure	Preparation for change in life structure

satisfied with my personal relationships? Are there things that I am missing? This assessment is a preparation for the modification of the life structure in the subsequent life era. Levinson assumed that three transitions take place during the life cycle: early adulthood (17-22 years), middle adulthood (40-45 years), late adulthood (60-65 years). Thus, according to his model of adult development, activities that here are called life review most likely occur throughout the life cycle.

Table 3 (see above) summarizes the above presented interpretations of selected theories of life-span development with regard to their conceptions of life review. It is clear from this table that life review has primarily been associated with the second half of adulthood. However, the theoretical models of Erikson, Levinson, and, as I would argue, also Neugarten demonstrate that life review can already occur in early adulthood. Table 3 also summarizes statements about the functions and triggers of life review. In the following section, these are outlined in more detail.

Functions and Triggers of Life Review

Besides statements concerning timing and frequency of life review, life-span theories can be interpreted in terms of suggestions with regard to the functions and triggers of life review (see Table 3). Jung (1971), for example, looked on life review as a means to reduce psychic tension which had built up as a consequence of one's undergoing change with the beginning of the second half of life. More specifically, in the context of Jung's writings, life review may be seen as triggered by a shift in the orientation of attention from the environment to the self. A potential function of life review is the restoration of psychic balance. Successful rebalancing, according to Jung, opens up the possibility for the individual's further psychological growth. In other words, life review, for Jung, was a means of fulfilling the needs of one's inner life and the development of the entire person.

Erikson's theory (1959) can be interpreted to view what here has been called life review as a means to cope with the final of his eight life tasks (integrity versus despair). Life review is primarily triggered by the confrontation with this final life task. Successful resolution of the task is related to the acquisition of new ego skills and attitudes. Unsuccessful resolution, on the other hand, could result in fixation. If through looking back over their life, the individual "maintains and conveys the integrity of experience, in spite of the decline of bodily and mental functions" (Erikson, 1959, p. 23), the challenge is mastered, and the person acquires the virtue of wisdom. If the life review, however, leads to the individual's dissatisfaction with his/her life, then despair will be the outcome.

Bühler suggested that self-assessment (i.e., looking back over one's life and evaluating it) is initiated to restore the balance threatened by the realization that the second half of life is dawning. The realization of this turning point in life together with the awareness of decline instigate, according to Bühler, a person to engage in life review. Reviewing one's life results either in a sense of fulfillment or failure. In a similar way, Neugarten pointed to the mastery of the finiteness of life as well as a re-assessment of life as important developmental functions of life review. The realization of the finiteness of life is related to the restructuring of life time from "time-since-birth" to "time-left-to-live." Interpreting Neugarten's ideas in a more general way, off-time life events could be added as potential triggers of life review.

As before, with respect to the timing of life review, Levinson again offered the most general conceptualization. According to his formulations, one of "the primary tasks of every transitional period is to reappraise the existing life structure" (1986, p. 7). This assessment of the previous life is a necessary preparation for a change in the life structure. Thus, life review may be seen as a means to cope with the future.

Life Review as a Coping Mechanism

Butler (1963), a gerontologist and psychiatrist, was the first to explicitly emphasize the therapeutic consequences of engaging in life review. He stressed the role of life review in furthering the psychological well-being of older adults. For Butler, life review closely resembled the process of psychotherapy (see also Cohler, 1982). His description of the function of life review followed the considerations of Erikson; namely as a means to facilitate acceptance of one's past (integrity). In his early writings, Butler (1963) viewed the awareness of one's mortality as a trigger for life review.

Butler's conception of life review has fostered an approach to clinical work with the aged which involves the use of life review as a therapeutic group technique (Kaminsky, 1984; Myerhoff, 1975). It is also through Butler's formulations that most of the empirical research on life review originated with a major interest in the possible functions of life review in the aged. Expressed in current psychological terminology, many investigators are interested in life review as a coping mechanism.[3] Death, age, and stress predominantly figure as targets of concern (e.g., Reker, 1985).

Table 3 (see above) has illustrated that life-cycle theorists suggested life review as a means of coping with psychic imbalance, with approaching death, with the current life task, with a life transition. These descriptions parallel Haan's conception (1977) of coping as an active process through which the individual tries to adapt to changed environmental and psychological conditions (i.e., disturbed balance) at different points in the life cycle. Of course, engaging in life review does not necessarily imply a successful resolution of one's problems (i.e., successful coping). It is possible, for example, to imagine a life review which ignores (denies) negative (or troublesome) aspects of one's past. In this sense, life review has also been described as a mechanism of defense (e.g., McMahon & Rhudnick, 1964). Interestingly, Haan (1977) applied the same term "defense" to an unrealistic way of coping.

Greenwald (1980, 1981) ascribed three biases to the "ego" which, he claimed, serve the maintenance of ego stability and retrospectively modify one's life history: "Egocentricity (self as focus of knowledge), beneffectance (perception of responsibility for desired, but not undesired outcomes) and cognitive conservation (resistance to cognitive change)" (1980, p. 603). Greenwald's argument is in line with psychodynamic theories (Freud, 1901; Adler, 1937) concerning the selectivity and distortion of autobiographical reconstructions as a means of conserving the status quo.

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[3] With regard to viewing life review as a coping mechanism, it has to be acknowledged that for most investigators, the phenomenon and incidence of life review primarily refers to the emotional and cognitive aspects of coping and less to the actions actually taken (e.g., actually inducing change on the environment) in order to cope with certain conditions (Lazarus, 1981).

Vaillant (1977) selected 18 defense mechanisms from the writings of 6 psychoanalysts and grouped them according to their relative maturity and pathological import. He distinguished between psychotic, immature, neurotic, and mature, what he called, adaptive mechanisms. Vaillant (1977) provided the following answer to the question up to which point a given mechanism of defense is adaptive and when it becomes pathological.

> "If a defense is used in a rigid, inflexible way, if it is motivated more by past needs than by present and future reality, if it too severely distorts the present situation, if it abolishes rather than limits gratification, or if it dams rather than rechannels the expression of feelings, then it is likely to be maladaptive." (p. 85)

In a similar vein, Butler conceptualized the success of a life review in terms of its adaptiveness for the individual. The quality of a life review is also mentioned by Erikson, when he related successful life review to the attainment of wisdom. In general, quality of a life review is discussed in relation to the mental health of the reviewer which is judged upon by a clinician.

Summary

Apart from a general interest of the social sciences in the content of an individual's review of his/her life (i.e., product), two major themes concerning life review as a procedure can be inferred from life-cycle theories of development. A first theme is the timing and frequency of life review across the life span. Concerning the timing and frequency of life review, it can be concluded that life review is a phenomenon that probably most often (inter- and intraindividually) occurs in middle and late adulthood but that also young adults engage in life review.

The second theme concerns the triggers and functional consequences of engaging in life review in terms of development and psychological well-being. Although the notion of triggers and functional consequences implies a certain causal relationship, various other relational options are conceivable. Phenomena suggested as antecedents and such described as consequences may also be considered correlates of life review or may influence each other reciprocally.

As a common denominator of the statements reviewed above, concerning triggers and functions of life review, it seems reasonable to propose that life review is associated with the unexpected, with the hindrance of familiar ways of being (see also Wollheim, 1984). Consequently, life review may be involved in the process of coping with the discrepancy between the expected (either by the individual or by society) and reality. Within the larger framework of personality development, as indicated by, for example, the work of Vaillant (1977), life review may be a relevant activity involved in the construction, maintenance, and transformation of the self or of a person's identity (Strube & Weinert, 1987).

Empirical Studies on Life Review

Reviewing the research findings in the field of reminiscence and life review is as difficult as it is to come to grips with the existing terminology on life review and related processes (for reviews see Merriam, 1980; Molinari & Reichlin, 1985; Romaniuk, 1981). This difficulty, however, does not come as a surprise. How can results be unequivocal given that no agreement has been established as to how the object of investigation should be defined and operationalized (Merriam, 1980)?

For the most part, there is more uncontrolled clinical observation than systematic empirical or even experimental research (Romaniuk, 1981). Nevertheless, it is possible to distinguish between primarily descriptive studies (Revere & Tobin, 1981; Romaniuk & Romaniuk, 1983) and studies that inquire into the relationships of life review to other constructs. In this latter group, correlational investigations (Coleman, 1974; Havighurst & Glasser, 1972; Lieberman & Falk, 1971) and intervention studies (Hughston & Merriam, 1982; Lewis, 1971; Perrotta & Meacham, 1982) can be distinguished.

The goal of this section is to provide an overview of data collection methods, variables, and findings that characterize research on life review and reminiscence. This overview, together with information gained in Chapter 2, will serve as background to the specific design and procedure adopted in the present study and described in Chapter 4.

Methods Used to Assess Life Review

By far, the data collection technique used most frequently to elicit reminiscences and life reviews has been the unstructured interview. The opening questions for such interviews varied from "interest in the old person's views about the past and the present" (Coleman, 1974) to "What do you see as important or significant in life?" (Lewis, 1971) or "You may talk about whatever you wish" (McMahon & Rhudnick, 1964). Some researchers have designed a more questionnaire-like series of questions (Lieberman & Falk, 1971), for example, "What was your life like as a child?, What were your parents like?" (Revere & Tobin, 1981) or "What were the most important events?, What were your big mistakes?, What were the most difficult decisions?" (Tismer, 1971). Finally, some studies used questionnaires on *experiences with* reminiscence and did not actually elicit reminiscences (Havighurst & Glasser, 1972).

Except for Coleman (1974), none of the cited studies checked on the validity of the instruction. For example, it remains unknown how easy it is for subjects to begin life review with such questions as stimuli. Moreover, individual differences may be more a function of subjects' different interpretations of the task demands (e.g., how long to talk, which topics to cover) than differences in the life review per se.

Variables Related to Differences in Life Review (Timing, Frequency, Function, Style)

Age Differences

A widely discussed question in research on life review and reminiscence concerns whether or not the frequency of these activities changes with age. Associated with this is the proposal that there may be general age differences in time perspective; specifically that older adults are primarily oriented towards the past while young and middle-aged adults are oriented towards the present and the future. It is a commonly held stereotype that old people live more in the past than younger adults and repeatedly present their environment (family and friends) with similar episodes of their lives. Systematic research on this topic has only been conducted on the activity of reminiscing (i.e., recalling past events).

Cameron (1972) used a thought sampling technique in a large-scale survey covering the whole life span and did not find differences in frequency between age groups. His results, however, might be questioned on methodological grounds. Cameron's thought samples ("What were you just thinking about, past, present or future?") were only taken between 8 a.m. and 8 p.m. The chosen time period might favor thinking of the present because people are involved in daily activities. Giambra (e.g., 1977) studied the relationship of daydreaming (past, present, and future content) and age. He noted that daydreaming frequency in general and frequency of past-oriented daydreams were not higher for older subjects.

Most of the literature acknowledges that asking *how much* one thinks about the past, present or future is theoretically less interesting and less constructive than asking *what* and *how* one thinks when dealing with these time periods (e.g., Reker, 1985). Bortner and Hultsch (1972) found that old people rated their past selves (on a scale with its extremes marked by the worst and best possible self the subject could imagine) higher than younger people did (see also Lieberman, 1970). However, the Bortner and Hultsch study also showed that old people assessed their future selves to be worse (lower) than younger people. It seemed that older adult's quality of past, present, and future self-assessments merge in comparison to the ones of younger people. Other interesting variables of the research on time perspective might be density (i.e., number of events thought of for a certain time period; Kastenbaum, 1961) and extension (i.e., length of time span covered; Wallace, 1956).

Lowenthal, Thurnher, and Chiriboga (1977) compared four pre-transitional age groups (before leaving college, before marriage, parents before children leave home, before retirement) and found no differences concerning frequency of reminiscence. Concerning style of reminiscence defined as "degree of involvement," however, old people showed greater involvement. When evaluating this result, one has to take into consideration that the study was not primarily geared towards reminiscence but towards personality development in general. No specific measure of reminiscence was used.

Associated with questions concerning the age-related differences in timing and frequency of life review, is an interest in possible age differences in the style of life review. To date, only two studies provide age-comparative data on differences in the style of life review.

Romaniuk and Romaniuk (1983) compared a young age (18–39 years; N = 131) with an older age group (61–98 years; N = 137), and Revere and Tobin (1981) compared middle-aged (44–55 years; N = 35) and older (65–103 years; N = 35) people. Revere and Tobin found that the style (dramatization, involvement) of reminiscing varied with age: Older adults dramatized more and showed greater involvement than younger adults. Romaniuk and Romaniuk (1983) investigated time setting of remembered events and content of reminiscences and found more similarities than differences between age groups: Both young and older subjects remembered more non-transitional than transitional events and their memories did not cluster in any particular time period.

Concerning the style and content of reminiscences, research on autobiographical and biographical memory, two just recently evolved branches of investigation within memory research, are of interest. Fitzgerald and Lawrence (1984), for example, found that there are more similarities than differences concerning the operation and content of autobiographical memory across age groups. Rubin and colleagues (Rubin, Wetzler, & Nebes, 1986) reviewed age-comparative studies on the distribution of memories across the life span. They provided a model of the distribution of autobiographical memories across the life span that is a combination of (a) power function of the retention interval for the most recent 20 to 30 years of a subject's life; (b) of a childhood amnesia component for the earliest years; and (c) if the subject is older than 35, of a monotonously increasing function for the subject's youth. Other interesting findings of research on autobiographical memory refer to the higher importance of situation-specific actions in comparison to that of trans-situational activities for retention (Reiser, Black, & Abelson, 1985); the superiority of autobiographical recall scores to biographical ones (Gehringer & Strube, 1985); or the developmental finding that with increasing age biographical knowledge becomes less schematic and stereotypical (Strube, 1985).

Coleman (1974) worked with an older age group ranging from 69 to 92 years of age (N = 48). He was inquiring into different types of reminiscence. In his conclusion, Coleman indicated that treating the age range from 69 to 92 as one class was not appropriate. Rather, he differentiated the older age group in a young-old and an old-old group because he had found that the young-old participants engaged more in active life review whereas the old-old individuals mostly displayed already finished life reviews.

To summarize, it is suggested that research so far has not provided evidence for age-related differences in timing and frequency of reminiscence or of life review. Studies have demonstrated, however, age differences in style of life review and of reminiscing. Older people showed more involvement and demonstrated a more positive evaluation of their past selves than younger adults. The distribution of remembered events does not differ between age groups. Starting as early as age 35, subjects shared a reminiscence effect concerning their youth. There is evidence, however, for a decrease in stereotypicality of biographical knowledge with increasing age.

Effect of Life Circumstances on Life Review

Lowenthal and colleagues (1977) reported that an individual's current life circumstances influence the style and frequency of life review. This finding is supported by another study from Lieberman and Falk (1971), where they compared one group of older people waiting for institutionalization (unstable life situation) with one not anticipating institutionalization and one group already being institutionalized (stable life situations). People in unstable life circumstances evidenced more involvement in reminiscence. These findings are in line with the proposal that life-stage transitions or developmental crises are likely to be associated with an increased frequency of life review (Hultsch & Plemmons, 1979; Levinson, 1986; LoGerfo, 1981; Lowenthal et al., 1977). Butler (1963), who started from the assumption that the approach of death is the critical trigger of life review, later acknowledged that critical life events might do the same (Butler, 1981).

Lewis (1971) hypothesized that when faced with a socially threatening situation (stress), reminiscers would show greater consistency in self-concept than non-reminiscers. According to the evaluation of unstructured interviews, subjects were designated as reminiscers or non-reminiscers and were placed in a stressful situation. Pre-test and post-test measures of past and present self-concept were recorded. Reminiscers showed a higher post-test correlation between past and present self-concept than non-reminiscers. Lewis concluded that reminiscing might contribute to successful aging (adaptation) by supporting the self-concept in times of stress.

One correlational study (Lieberman & Falk, 1971) explored the role of reminiscence in adapting to stress (waiting for institutionalization). Lieberman and Falk first asked participants to recount their lives and then added questions which required the individual to reflect upon his/her life evaluatively. The study demonstrated that unstable life circumstances (waiting for institutionalization) precipitated more involvement in reminiscence and were related to more cognitive restructuring of life history material. However, they did not find a positive relation between life review and adaptation one year after the institutionalization had taken place.

Not only current life circumstances but also the life events a person has experienced in the past seem to be of importance for the procedure and the product of life review (e.g., Havighurst & Glasser, 1972; Kastenbaum, 1977). Rather than triggering life review, past life experiences contribute, together with situational and person characteristics, to the content and the emotional slant of the life review.

Person Characteristics and Life Review

Further variables of interest that should be taken into consideration were related to personality and cognitive characteristics. As you may remember, Butler (1963) saw success or failure of life review associated with personality features like flexibility, resilience, and self-awareness. From their questionnaire study on reminiscence, Havighurst and Glasser (1972) concluded that a more internally oriented person seems to produce more reminiscences than a rather externally oriented one.

Among other cognitive personality characteristics of interest, cognitive styles like impulsivity versus reflection (Romaniuk, 1981) and leveling versus sharpening (De

Motts, 1981) have been investigated. Primarily reflective persons and also "sharpeners" are more prone to life review than people located at the other end of the two dimensions. Coleman (1974), in a very systematic study, found no relationship between life review scores and present adjustment (life satisfaction, lack of depression). However, for people dissatisfied with the past, "noticable" life reviewers exhibited higher adjustment than "slight" life reviewers. Dissatisfaction with the past appeared to be a modifying variable. Similarly, in a small, more clinically oriented study, McMahon and Rhudnick (1964) found that non-depressed subjects reminisced more than those who were depressed.

Havighurst and Glasser (1972), in an extensive questionnaire study (N = 529) covering the frequency, affective quality, content and function of reminiscence, obtained a relationship between personal-social adjustment, positive affect of reminiscence, and high frequency. Havighurst and Glasser subsumed both phenomena, here defined as reminiscence (i. e., recalling past events) and life review (i. e., recalling past events and further analyzing the recalled material), under the one label of reminiscence. These authors speculated that the phenomenon of reminiscence was "caused by a multiplicity of factors in the personality and life experiences of a person" (Havighurst & Glasser, 1972, p. 253).

Finally, cognitive processes may be of importance for the procedural components of life review. Does an individual have the cognitive capacity to reflect upon their life? Which degree of reflection can an individual reach? It seems that the relationship between life review and the capacity in fluid and crystallized intelligence should be worth investigating (Hughston & Merriam, 1982; Sperbeck, 1982).

Summary

Differences in sample characteristics, definitions, and methods between the studies on life review and reminiscence, make a systematic comparison almost impossible. The overall impression is that chronological age *per se* has been wrongly interpreted as an antecedent of life review and should instead be considered a correlate of life review.

The phenomenon life review, as it has been defined here, seems to vary in frequency, function, trigger, content, and style throughout the life course. Life history factors (not evincing a high correlation with age) associated with life ecology (past life events; e. g., Kastenbaum, 1977; current life circumstances; e. g., Lieberman & Falk, 1971), personality (e. g., internality/externality; Havighurst & Glasser, 1972), and cognitive systems (e. g., fluid and verbal intellectual capacity; Sperbeck, 1982) seem to play a substantial role and need further investigation.

At the same time, however, the literature review suggests that life review is a phenomenon in which many individuals engage throughout their lives. Thus, it appears possible that mental representations about the life course and its varied manifestations (biographical memory) as well as knowledge about possible interpretations and evaluations of such life courses can be identified when individuals engage in life review. Finally, in terms of research design and procedure, it can be concluded that attention should be paid to a clear definition and a corresponding index measure of life review; and that the validity of the instructions should be carefully checked.

Chapter 4
The Present Study of Life Review

On a societal level, the framework for the present investigation is provided by a growing aged population in industrialized societies, a population which in the future will most likely present us with changing societal conditions. Given the still prevailing negative aging stereotype, the discussion of such demographic changes, so far, has focused on the potential problems associated with a growing aged population. The aim of the present study is to provide some evidence supporting a more balanced view on aging.

Life-Span Development of Intellectual Functioning

The content domain of intellectual aging was selected as a sample case to accomplish this goal. Research in the field of intellectual development has provided a quite complex and confusing picture with evidence for decline, as well as for stability and growth of intellectual functioning (Berg & Sternberg, 1985; Denney, 1984; Labouvie-Vief, 1985; Rybash et al., 1986; Salthouse, 1985). The life-span perspective on intellectual development has helped to clarify the picture (Baltes, 1987).

Life-span development of intellectual functioning is characterized as being multidimensional, multidirectional, as showing great interindividual variability, and as evincing intraindividual plasticity. Hence, various facets of intellectual functioning are distinguished. The dual-process model of intellectual functioning which is adopted for the present study, for example, differentiates the mechanics from the pragmatics of intelligence (Baltes et al., 1984). Acknowledging inter- and intraindividual plasticity, the mechanics of intelligence are proposed to be associated with a trajectory of decline. The pragmatics of intelligence, on the other hand, hold the potential for stability and growth across the life span.

In particular, the consideration of the functional aspects of intellectual behavior and, therefore, the attention to age-related life ecologies provided empirical evidence for stability and growth in intellectual functioning across the life span (Labouvie-Vief, 1985; Perlmutter, 1987; Smith et al., in press). Along this line of reasoning, wisdom is conceptualized as a prototype of growth in the pragmatics of intelligence (Dittmann-Kohli & Baltes, in press).

Wisdom as a Prototype of Growth in Intellectual Functioning

Applying a research paradigm associated with cognitive psychology and the study of knowledge systems to life-span research (Charness, 1979; Chi et al., 1982; Newell &

Simon, 1972; Salthouse, 1985), wisdom has been defined as expertise in the knowledge domain "fundamental pragmatics of life" (Baltes & Smith, 1987). It is assumed that knowledge in the fundamental life pragmatics may find expression in discourse about life matters such as life review, life planning, and life management.

For a further specification of wisdom as expertise in the fundamental pragmatics of life, various lines of inquiry are combined, such as specifications of the everyday meaning of wisdom (Holliday & Chandler, 1986; Clayton & Birren, 1980; Sternberg, 1985b), cognitive structuralists' and developmentalists' search for new forms of mature adult reasoning (Commons et al., 1984; Labouvie-Vief, 1985; Meacham, 1983), and theories of life-span personality development (Erikson, 1959; Erikson et al., 1986). Wisdom as an expertise is indexed by a family of five criteria: good judgement and advice in life matters, rich factual and procedural knowledge about life, contextualism, relativism, and awareness of uncertainty (Baltes & Smith, 1987).

Life Review: An Avenue to Knowledge About the Fundamental Pragmatics of Life

For the present study, life review was selected as a means to access an individual's knowledge system associated with the fundamental pragmatics of life. Therefore, a Life Review Task specifically developed for the present study is at the center of the empirical investigation.

The review in Chapter 2 pointed to the importance of the ecological validity of tasks whenever intellectual functioning is to be assessed in different age groups covering the adult life span. Reviewing the literature on life review in Chapter 3, in turn, suggested that people engage in life review during the whole adult life span. Hence, life review seems to be an ecologically valid task for young, middle-aged and older adults. Chapter 3, furthermore, demonstrated that life review is an adequate and in the social sciences widely employed phenomena to access an individual's knowledge about their own life and the life of others.

Proposed Definition of Life Review

Life review is defined here as a two-fold procedure. One procedural aspect refers to the selection and reconstruction of life events from memory. The other procedural aspect refers to the interpretation and evaluation of the reconstructed material in the context of one's past, present, and future life.

Both terms, interpretation and evaluation, are understood within an action theory framework (e.g., Hacker, Volpert, & v. Cranach, 1983; Werbik, 1978). Interpretation concerns the explanation of action through emotional or motivational states, external conditions, or a combination of all three (i.e., a person acted in a certain way because he/she was, for example, angry or because he/she was forced to act that way by some institution or both). The term evaluation refers to the values or goals which are used to judge a life course or single action (e.g., Brandtstädter, 1982).

Interpretation, evaluation, as well as selection and reconstruction are expected to be primarily guided by experienced features of life-long development: its normative course and the specific tasks characterizing the life cycle. Life review is considered as an active cognitive procedure as opposed to the image of simply re-living or re-viving the past.

Usually, life review is thought of in terms of selection and reconstruction from *auto*biographical memory: that is, as a review of one's *own* life. For the purpose of this study, however, the definition of life review was extended to the *review of another* (fictitious) person's life. The specific paradigm applied in this study is to have a subject produce another person's life review based on their knowledge about the nature of life-span development. This extension in meaning is associated with the primary interest of the present study in life review as one avenue to the knowledge system "fundamental life pragmatics" and not to the therapeutic or adaptive function of life review for the reviewing individual.

The Life Review Task

The proposed definition of life review in combination with conclusions drawn from the theoretical discussion in Chapters 2 and 3 provide a framework for the construction of the Life Review Task (LRT). Specifically, three issues are discussed. First, since the Life Review Task is an attempt to capture wisdom empirically, the theoretical concept of wisdom as introduced in Chapter 2 has to be taken into consideration when constructing the task. Second, the extension of the life review notion to include another person's life review is further elaborated by the simulation paradigm. Finally, the Life Review Task is considered as an instance of complex problem-solving in an ill-defined knowledge domain. Different levels of problem difficulty are distinguished.

The Concept of Wisdom

The conception of wisdom (see Chapter 2) as expert knowledge in the fundamental pragmatics of life served as one guideline for the construction of the Life Review Task. Since this concept of wisdom focuses on the judgemental aspect of wisdom as well as the assumption that wisdom becomes especially visible in difficult cases or problematic situations (e.g., Baltes et al., 1984; Kekes, 1983), the Life Review Task presents the subject with a dilemma-like situation.

In contrast to the task used in parallel work on life planning (Smith et al., in press), which asked for judgement about the future, the Life Review Task asks for judgement about the past. Subjects are asked how an individual's life decisions may have come about, and how he/she may view this development retrospectively. Furthermore, the task wording tries to represent all aspects of the presented definition of life review, that is the selection and reconstruction of events as well as their interpretation and evaluation.

The Life Review Task and the Simulation Paradigm

For some time, the simulation of age differences has been propagated and employed as a useful tool in developmental research (e.g., Baltes & Goulet, 1971), especially in research on ontogenetic (objective) versus perceived (subjective) age differences (e.g., Ahammer & Baltes, 1972; Riegel, 1971; Thomae, 1970). The major intention of such research has been the manipulation of age-related change under controlled and time-compressed conditions; to produce behavioral changes in a short period of time that were indicative of and/or analogous to long-term ontogenetic changes.

In the present study, the simulation paradigm is used somewhat differently. The simulation related to the Life Review Task[1] is two-fold. First, the simulation involves that the life review is constructed for another, fictitious person. We hoped that focusing the life review on another, fictitious person would primarily tap into a person's general knowledge system about life pragmatics rather than a person's psychological state of mind or his/her unique life circumstances. Previous research on personal life review has shown that such protocols are to a large degree a measure of the psychological health status of the reviewer. The individual's general knowledge about the fundamental pragmatics of life seems to play but a secondary role (e.g., Butler, 1974). In a similar vein, it is assumed that by distancing the life review from the participant as a target, it may be easier for the subject to talk about all aspects that came to mind even if these aspects were personally problematic.

Table 4: The Life Review Task and the Simulation Paradigm

	Target Review Age		
Subject Age	Young Age	Middle Age	Old Age
Young Age	concurrent life review	*prospective life review*	*prospective life review*
Middle Age	*retrospective life review*	concurrent life review	*prospective life review*
Old Age	*retrospective life review*	*retrospective life review*	concurrent life review

Note. Retrospective life review: target review age is lower than subject age.
Concurrent life review: target review age is about the same as subject age.
Prospective life review: target review age is higher than subject age.

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[1] The terms Life Review Task and Life Review Simulation Task are used synonymously to denote the central instrument of inquiry of the present study.

Second, the simulation involves that different target-review ages are used for the purpose of gaining coverage of the entire spectrum of adult life. Three life review problems addressing three different target-review ages were constructed. The variation of target-review ages allows us to investigate the life-span scope of subjects' knowledge about the fundamental pragmatics of life. Chronological age (subject age) and life review age (target-review age) are separately matched so that, for example, a young subject is asked to review the life of an older person, or an older subject that of a young fictitious person.

As a consequence of matching subject age and target-review age separately, three kinds of life reviews were involved in the design of the present study: (1) "concurrent" life review where target-review age and subject age were approximately the same, this kind of life review is probably closest to reviewing one's own life; (2) "retrospective" life review where the target-review age was lower than subject age; and (3) "prospective" life review where the target-review age was higher than the subject age (see Table 4 above).

The Life Review Task: An Ill-Defined Task with Various Levels of Difficulty

By distancing the life review from the subject as target, the Life Review Task can be thought of as an instance of problem solving rather than *only* retrieval or remembering. Thereby, it can be related to the problem-solving research reviewed in Chapter 2. Since the Life Review Simulation Task attempts to access subjects' knowledge of the ill-defined domain "fundamental life pragmatics" it can be further characterized as an ill-defined problem:

1. Unlike a mathematical problem, it does not only have one "right" solution.
2. Only some central pieces of information are provided, the remainder is left for the subject to construct.
3. It is not objectively defined when the final solution is reached; the subject has to decide this him/herself.
4. Many alternative solution strategies and pathways are conceivable. Depending on the subject's own life experiences, and knowledge derived from his/her own life, creative thinking, general knowledge about life (other people, books, films etc.) or social stereotypes will be applied in varying degrees.

The variation of target-review ages implies (depending on the subject's age) varying levels of problem difficulty.[2] Depending on the assigned subject's age, the three life review problems either involve a concurrent, a retrospective or a prospective life review, and hence vary in difficulty. Difficulty is defined here in terms of how much personal experience is likely to be available or whether general knowledge, creativity, and stereotypes have to be applied. Consequently, life review with no age difference between subject and target-review age is assumed to be the "least difficult." With increasing age difference between subject and target-review age, the life review gradually increases in difficulty. Most likely, prospective life reviews are in general more difficult than retrospective ones because the latter in any case involves parts of the life course that the subject has already lived through. For prospective life reviews, on the other hand, one is forced to draw on the lives of other people or media.

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[2] *Difficulty* is a characteristic often used to classify problem types (e.g., Funke, 1984).

Criteria for Quality of Response to the Life Review Task

How is the quantity and quality of knowledge about fundamental life pragmatics as represented in an individual's response to the Life Review Task measured?

Based on the experiences of research on everyday intellectual functioning, as reported in Chapter 2, expertise in the ill-defined knowledge domain "fundamental pragmatics of life" was assessed via a rating procedure which will be described in detail below (see p. 109). The five wisdom-related criteria (good advice, rich knowledge, contextualism, relativism, awareness of uncertainty) developed by Baltes and Smith (1987) are adopted as indices of expertise in the fundamental pragmatics of life, and used as a basis from which six rating scales are developed (good advice, rich knowledge about life, rich knowledge about life review, contextualistic thinking, relativistic thinking, awareness of uncertainty). An expert panel is recruited to judge the quality of subjects' task performance. An individual is called an expert in the fundamental pragmatics of life (i.e., is called wise) only if his/her response evinces very high response quality on all wisdom-related criteria. The three subject-age groups (young, middle-aged, old) are compared concerning their rating scores on the wisdom-related scales.

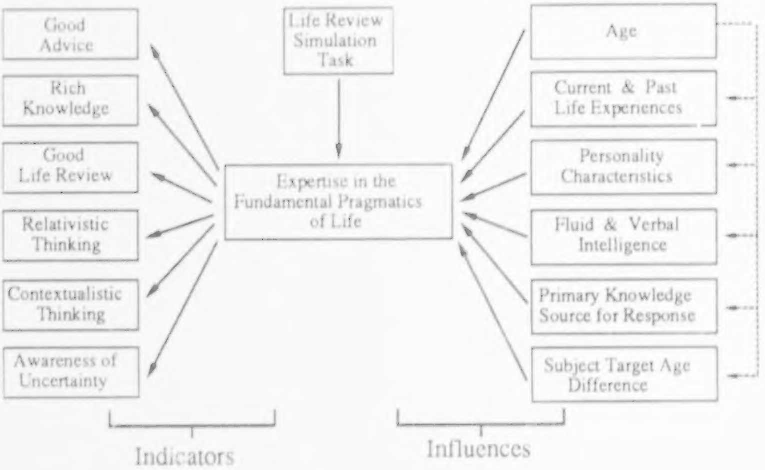
Note that for the assessment of response quality it is neither important whether the memories nor whether the interpretations are "true" or not. What is important, however, is which events and experiences a person includes in the life story as well as how he/she interprets and evaluates these materials. The focus is on the nature of mental representations not on their veridicality by reference to external, objectively observable behaviors or events. Consequently, also when the term knowledge is used, it does not denote its scientific or traditional philosophical meaning as facts proved by empirical evidence or by epistomological procedures. Rather, it refers to the personal knowledge (Polanyi, 1958) of our participants about the fundamental pragmatics of life. The knowledge system studied is essentially a subjective one.

Questions of the Study

The present study aims at answering three classes of questions. The main class refers to age differences in quality of responses to the Life Review Simulation Task. A second set of questions concerns performance factors involved when responding to the LRT. Finally, some exploratory questions are asked with respect to alternative predictors (proxies of chronological age) of response quality.

Figure 5 (see below) provides a general illustration of the central hypotheses of the present study which are elaborated below.

Figure 5: A Model of Expertise in the Knowledge Domain "Fundamental Life Pragmatics" as Accessed by a Live Review Task


Good Advice
Rich Knowledge
Good Life Review
Relativistic Thinking
Contextualistic Thinking
Awareness of Uncertainty
Life Review Simulation Task
Expertise in the Fundamental Pragmatics of Life
Age
Current & Past Life Experiences
Personality Characteristics
Fluid & Verbal Intelligence
Primary Knowledge Source for Response
Subject Target Age Difference
Indicators
Influences

Age Differences in Quality of Responses to Life Review Task

At present, little direct empirical evidence is available to guide our hypotheses. The research analogue used is new. The hypotheses, therefore, were guided primarily by fairly general theoretical conceptions of intellectual life-span development (e.g., Baltes et al., 1984; Baltes, 1987).

The "strong" life-span developmental hypothesis is that healthy older adults may evince high levels of performance in the knowledge domain "fundamental pragmatics of life." It is expected that older adults perform as well as or better than younger adults. In the present study, this knowledge domain is accessed by the Life Review Task. As described above, a high level of performance in the response to the Life Review Task is indexed by high scores on the six rating scales of good advice, rich knowledge, good life review, contextualistic thinking, relativistic thinking, and thinking that acknowledges the uncertainty in life.

Two "weaker" life-span developmental expectations are that healthy older adults may perform as well as or better than younger adults both on some wisdom-related dimensions and with regard to some target-review ages.

Modification of the "Strong" Life-Span Developmental Hypothesis by Wisdom-Related Dimension

Building on theory and empirical evidence in the field of skill acquisition (e.g., Anderson, 1982), it is assumed that the more general aspects of a skill are expected to precede the more specific and refined features in the development of the expertise. As a heuristic, the wisdom-related dimensions good advice, rich knowledge about life, and rich knowledge about life review are designated as "more" general, and the dimensions contextualistic thinking, relativistic thinking, and awareness of uncertainty as "more" specific and refined.

Using this line of reasoning, smaller age differences are expected for the ratings on the general scales: good advice, rich knowledge about life, rich knowledge about life review. Larger age differences are expected for the more specific and refined scales: contextualistic thinking, relativistic thinking, and awareness of uncertainty. As knowledge in the domain "fundamental pragmatics of life"—among other factors—accumulates with age, the younger subject-age groups (young, middle-aged) have probably acquired higher levels of knowledge for some aspects of the knowledge system. High levels of performance on the more specific and highly refined aspects of the skill (relativism, contextualism, awareness of uncertainty), however, may have been confined to the older subject-age group.

Modification of the "Strong" Life-Span Developmental Hypothesis by Target-Review Age

It is furthermore expected that older subjects would primarily show higher levels of performance in the life reviews constructed for an old target person. The more general assumption is that subjects would show highest levels of performance for the target review close to their own age. This kind of life review may enable subjects best to express knowledge about fundamental life pragmatics because they are most familiar with that part of the life span. This expectation finds some support in a study on life planning (Smith et al., in press). In this study, older adults were rated higher on their plans for the old-age nonnormative problem, and younger adults were rated higher on the early adulthood nonnormative problem.

Control Variables

In addition to age differences, quality of responses to the LRT may be influenced by a number of variables not associated with age, or associated with age in a manner that is theory-inappropriate. Some of these variables, such as verbal proficiency, total number of words spoken during response, years of education, and transitional character of life circumstances are controlled for.

The interest of the study is in subjects' knowledge about fundamental pragmatics of life and not in subjects' verbal proficiency or level of education. Therefore, we controlled for subjects' verbal ability and years of education. According to the literature on life review (e.g., Lieberman & Falk, 1971; Romaniuk & Romaniuk, 1981) the transitional character of subjects' current life situation is related to the frequency with which individuals engage in life review. Subjects who frequently engage in life review at the present time may have their knowledge about fundamental life pragmatics more readily available than subjects who don't. According to the sociology of the life span (e.g., Kohli, 1985), older adults are less likely to be in a transition than younger adults. Hence, higher availability of knowledge in the interview situation may be age-related in a theory-inappropriate way. Finally, following evidence from the rating literature (e.g., Langer & Schulz v. Thun, 1974), the total number of words spoken (i.e., the length of the transcribed protocol) is expected to influence the rating process. Raters tend to score longer protocols higher than shorter ones. Therefore, possible age-related differences in length of protocols are controlled for.

Alternative Predictors of Response Quality (Proxies of Chronological Age)

The central expectations of the present study involve chronological age as a critical grouping factor. Results of life-span research (e.g., Birren & Cunningham, 1985; Neugarten, 1968), however, denote chronological age as a carrier variable for a large number of variables putatively associated with length of life and the nature of biological and experiential changes during ontogeny, such as personality characteristics, life experience, cognitive functioning etc.

Butler (1963) and Havighurst and Glasser (1972) have especially pointed to the relation between successful life review and certain personality characteristics (see Chapter 3, p. 70). We assume that this relationship can be generalized to the accumulation of knowledge about the fundamental pragmatics of life. It is explored whether certain personality characteristics are prerequisites for an individual to be motivated to reflect about life and to gain insight from experience, and therefore attain a higher level of knowledge about fundamental life pragmatics. Following Dörner et al. (1983), personality characteristics are neither conceptualized as traits nor as states but as the often recurring and relatively stable usage of the same cognitive processes. These cognitive processes may facilitate or hinder the cognitive processes connected to the acquisition of expertise in the knowledge domain fundamental life pragmatics. In addition to personality characteristics, it was explored whether the amount and quality of life experiences would predict the quality of responses to the LRT.

Performance Variables Related to the Life Review Task

The Life Review Task has been especially developed for the purpose of this study and the whole research approach to the study of intellectual functioning is still quite new. Therefore, the relationship between a number of performance variables associated with the LRT seems to be of interest for the interpretation of results.

Subject Target Age Difference and Quality of Response

Depending on the specific combination of subject age and target-review age, subject target age differences (STAD) vary in terms of temporal distance (zero, one unit, two units) and of temporal direction (retrospective, prospective) and constitute varying levels of task difficulty (see Table 4 above; p. 87).

With regard to temporal distance, it is expected that life reviews with zero subject target age difference (concurrent life review) are rated higher (i.e., less difficult) than life reviews with one unit STAD, followed by life reviews with two units of subject target age difference. Furthermore, when taking into consideration both temporal direction and temporal distance, it is expected that for life reviews that have to bridge two units of age difference the advantage of retrospective over prospective life reviews would vanish. Retrospection bridging two units of age difference implies the construction of a life review for a presently young person by an old subject. Socio-cultural differences, in regard to being young now as compared to 40 to 50 years ago, may outweigh the advantage of having lived through that time period oneself.

Subject Age and Primary Knowledge Source

The LRT asks subjects to construct the life review for a fictitious person. The primary knowledge source employed by the subject to respond to the task therefore seems to be an interesting performance variable to consider. The expectation is that the primary knowledge source employed will vary as a function of subject and target-review age. Whether the kind of primary knowledge source employed will also show in the quality ratings of responses is left to empirical investigation.

With regard to subject age, it is expected that younger subjects will tend to refer more to impersonal sources of knowledge, like books, films, social stereotypes than older participants. However, within subject age the primary knowledge source may vary according to the temporal distance between target-review age and subject age. Within each subject-age group, the concurrent life reviews are hypothesized to be associated with the primary use of more personal knowledge sources. With growing difference between subject and target-review age, the degree of impersonal knowledge sources employed is expected to increase.

The Life Review Task as a Task Assessing Intellectual Functioning Across the Life Span

The LRT is constructed so as to tap into additional aspects of intellectual functioning beyond fluid intelligence measures. However, fluid intelligence, as argued in Cattell's and Horn's theory (Cattell, 1971; Horn, 1982), is always a constitutive element of crystallized intelligence as well. Hence, life review measures are expected to show a positive correlation with fluid measures.

The degree to which life review measures would show a relationship with measures of crystallized intelligence is expected to be dependent on the nature of the crystallized domain considered. In other words, while measures of quality of response to the Life Review Task should show a positive correlation with fluid measures, their relationship with crystallized measures should vary according to the extent of overlap in the respective domains of crystallized knowledge and skills.

Furthermore, with regard to aspects of ecological validity, it is expected that the LRT is a task of comparable familiarity and difficulty for all age groups. Contrary to fluid intelligence measures (see Cornelius, 1984), the LRT should represent an aspect of intellectual functioning which is of similar familiarity and self-perceived difficulty for all age groups.

Chapter 5
Methods

The first part of this chapter will deal with questions of design, subjects, materials for data collection, and procedure. Subsequently, the data preparation and scoring applied to the various data sets will be presented.

Design and General Procedure

To investigate possible age-related differences in individuals' knowledge systems about the fundamental pragmatics of life as accessed through discourse about a life review problem, subjects of different ages were asked to talk about life review problems characteristic of three target-review ages. This general procedure resulted in a 3 (subject age: 25–35, 45–55, 65–75 years) × 3 (target-review age: young, middle-aged, old) between-subjects, factorial design (see Table 5 below).

Specifically, subjects were asked to simulate the life review of a fictitious target person. Each subject responded to one target-review age. Within each subject-age group (N = 21), target-review ages were randomly assigned. Thus, the design was orthogonal with a total sample size of N = 63.

Subjects

Because the present study involved intensive individual interview sessions, the sample size was comparatively small (N = 63; i.e., 9 groups × 7). Subjects were all female German nationals. Given the comparatively small sample size, it was decided to not

Table 5: Design of the Present Study

	Target Review Age			
Subject Age	Young Age	Middle Age	Old Age	
25–35	7	7	7	21
45–55	7	7	7	21
65–75	7	7	7	21
	21	21	21	63

Note. Within subject-age group, participants were randomly assigned to target review ages.

include gender as a further design variable. Participants were recruited through a newspaper advertisement and were offered 50 DM per session both for their participation and to cover their traveling expenses.

Selection Criteria

The sample was selected so as to draw on women of different ages with experience in *both* the family/relationship and the work domains. In sum, selection criteria included: age (25–35, 45–55, 65–75 years), marital status (married/living in relationship, divorced, widowed), and professional status (higher-level employee, university degree).

These selection criteria represented an attempt to control for personal contact with the two life domains that were primarily relevant to the task vignette (see below). The selection criteria used, however, only controlled for the number of life domains. Further differences in subjects' amount and quality of life experiences within these domains were still possible. For example, older subjects might have had a longer history of experiences within each of these domains. Also, aside from extent of experience, subjects may show qualitative differences, for example, in the nature of tutelage or reflection concerning such experiences.

In addition, sample selection had to guarantee a certain educational level and verbal ability sufficient for subjects to feel comfortable with a method of data collection that involved verbalizing ideas. Pilot work with a heterogeneous sample in terms of such selection criteria had pointed to the importance of controlling for some sample homogeneity. Also, when considering the small sample size, random sampling did not seem to be a reasonable alternative.

Table 6 (see below) summarizes the main characteristics of the sample separately for each age group. All subjects were/had been professionals, had above average verbal ability, and average fluid intelligence scores. Furthermore, the sample can be characterized as psychologically and physiologically healthy, and age groups did not differ in self-reported happiness and mental activity. Sample characteristics and differences between age groups are elaborated on below.

Chronological Age

As is most often the case in developmental research, a fixed-level approach to the selection of age level was employed (Baltes, Reese, & Nesselroade, 1977). Following the main interest of the study in age differences, discontinuous rather than continuous age groups were chosen. In addition, it can be assumed that the ages 25, 45, and 65 years are probably related to different stages in the development of the two life domains, work and family, as it will be discussed when introducing the task vignettes.

Table 6: Sample Characteristics

	Subjects		
Variable	Young Age	Middle Age	Old Age
Age			
Mean	30.76	48.76	68.52
SD	2.77	2.68	3.03
Range	26–35	45–56	64–71
Years of Education			
Mean	19.43	17.82	15.91
SD	3.56	3.11	3.42
Range	13–25	12–23	11–25
Number of Children			
Mean	.38	2.19	1.86
SD	.67	.6	1.24
Range	0–2	0–3	0–4
Legal Status			
Married/Relationship	86% (18)	52% (11)	24% (5)
Divorced	14% (3)	48% (10)	24% (5)
Widowed			52% (11)
Verbal Intelligence[a] (raw scores)			
Mean	62.71	65.91	64.43
SD	7.31	5.34	5.64
Range	50–76	55–77	54–77
Verbal Intelligence (standardized scores)			
Mean	109.57	112.14	116.84
SD	5.46	5.14	8.28
Range	100–115	105–120	106–127
Fluid Intelligence[b] (raw scores)			
Mean	13.52	12.1	7.0
SD	3.28	3.67	3.66
Range	6–18	4–17	2–14
Fluid Intelligence (standardized scores)			
Mean	98.57	92.72	100.71
SD	13.32	15.05	13.6
Range	76–117	66–113	82–127
Neuroticism[c]			
Mean	88.05	63.52	75.98
SD	24.32	31.98	26.85
Range	50–136	17–152	23–122

[a] Maximal raw score: 84

[b] Maximal raw score: 18

[c] Maximal raw score: 192

Marital Status

Subjects of all age groups had been or were married (lived in a relationship) and had followed some professional career. The majority of the young women (86%, N = 18) lived in a relationship or were married, the minority was divorced. In the middle-aged group, both kinds of legal status were about equally represented (married/relationship: 52%, N = 11; divorced: 48%, N = 10). And in the old age group the majority of women were widowed (52%, N = 11).

The original intention to include family status (child/children) as additional selection criterion, had to be given up, as too few young women had had professional experience *and* children. Consequently, 71% (N = 15) of the young participants had no children whereas only 9.5% (N = 2) of the older women had no children, and none of the middle-aged subjects was childless. Thus, the majority of the young subjects had not had experience of a relationship involving children.

Professional and Educational Status

Participants' professional status either referred to positions as higher-level employees, as independent professionals or higher-level civil servants. As a function of age, the younger subjects had fewer years of professional experience than the middle-aged and older participants. Overall the sample was biased towards women with above average educational status. As a consequence of present educational opportunities, more of the younger subjects reported a clear-cut career of higher education (i.e., moving from elementary school to Gymnasium to university), whereas more of the older subjects reported an educational career full of detours (i.e., returning to school later in life, or pursuing further education).

Thus, age groups significantly differed in years of education ($F(2, 60) = 130.51$, $p < .005$). More specifically, young and old subjects showed significant differences (Scheffé test, $p < .05$). Young subjects on the average had 19 years and old subjects 15 years of education.[1] This difference is within the range to be expected by cohort differences in reference to the female level of education. In a German female cohort of the birth years 1920 to 1922, for example, which is comparable to the old subject-age group in the present study, only 5.3% have higher education (Abitur, university). Whereas, in a cohort of the birth years 1952 to 1954, which can be compared to the present young subject-age group, 18.1% have higher education (Handl, 1985).

Related to their professional and educational status, subjects had above average verbal (HAWIE Vocabulary: $M = 113$, $SD = 6.04$) and average fluid IQ (APM Subset: $M = 97$, $SD = 14.2$) according to estimated standardized scores.[2] There were no significant age differences in verbal ability (F(2, 54) = 1.68, $p < .2$). As expected from the review of research on the development of fluid intelligence, subjects differed significantly in their fluid intelligence scores (F(2, 54) = 18.85, p = .0). Old subjects scored lowest ($M_{old} = 7.0$, SD = 3.66), followed by the middle-aged women ($M_{middle\text{-}aged} = 12.1$, SD = 3.67) and the young participants ($M_{young} = 13.5$, SD = 3.25)[3] who had the highest scores on the fluid intelligence measure. It has to be kept in mind, however, that compared with their reference group in the population, the older subjects of the sample showed average levels of performance (M = 101, SD = 14).

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[1] Years of education was defined as including any kind of education, ranging from elementary school to professional training.

[2] The estimation of the standardized fluid IQ score may be too strict, and the standardization of the vocabulary score may slightly overestimate the Verbal IQ score. Information about the standardization procedure for both measures can be obtained from the author upon request.

Additional Sample Characteristics

A number of additional measures was administered to describe the sample with regard to psychological health, subjective physical health, as well as life satisfaction and mental activity in life. According to the neuroticism scale of the NEO Personality Inventory (NEO; Costa & McCrae, 1985), subjects were within the population's average range according to standardized scores;[4] there were no age-related differences (F(2, 60) = 1.01, $p > .37$). Thus, the sample can be described as psychologically healthy.

As to be expected, subjects differed significantly in their reports on subjective health ($\chi^2(6) = 21.78$, $p < .005$). The majority of the old subjects (57%, N = 12) reported fair health, whereas in the young subject-age group the majority (52%, N = 11) reported excellent health. The middle-aged women were similar to the older participants: 43% (N = 9) reported average health. According to a study by LaRue, Bank, Jarvik, and Hetland (1979), self-reports can provide a valid, cost-effective means of health assessment in studies lacking other forms of health information. As a consequence, we can assume that the majority of the older subjects was of satisfactory health (only two older women reported "poor health").

Furthermore, subject-age groups did not significantly differ in their self-reported satisfaction with life: 60% (N = 37) of the sample were "rather satisfied" and 35% (N = 22) "very satisfied" with their life; only 6% (N = 4) were "rather unsatisfied." Nor were there age differences in self-reported feelings of current happiness: 60% (N = 38) of the sample felt "happier" (now, if compared with the past), 15% (N = 9) felt "less happy," and 25% (N = 16) had not experienced a change in happiness. In contrast to the common negative aging stereotype, but in accordance with gerontological research (Baltes & Baltes, 1986), old women did not feel less happy than younger participants.

There were also no differences in self-reported mental activity: 46% (N = 29) of the sample reported that the mental demands (as estimated for their past lives) had been just right, and 38% (N = 24) reported that they had had a very active mental life. Too many and too few mental demands were reported by only 8% (N = 5) of the subjects.[5]

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[3] The reported figures refer to raw scores of the short version of the APM. The maximal raw score is 18.

[4] NEO standardized scores were used, after it had been checked that means and standard deviations of the study's population did not differ from those of Costa & McCrae's population used for standardizing the questionnaire.

[5] Age-specific distributions were compared by a χ^2-test: Satisfaction with life ($\chi^2(6) = 3.66$,

Materials for Data Collection

Below, materials for data collection as used in the present study are presented and the reasons for their selection or construction are outlined.

The Life Review Simulation Task

The Life Review Simulation Task asked subjects to imagine how a fictitious woman, being either young, middle-aged or old and described in a brief script, might review her life (see Table 7 below for exemplar task).[6] The script mentioned in addition to age, marital and family status, a major family life transition, and the fact that the fictitious woman decided at some point to give up her career in order to have a family. Furthermore, a setting is provided to explain why the fictitious woman is reviewing her life. The setting for all three target-review ages was the same: The fictitious woman meets a woman friend whom she has not seen for a long time and who had chosen to pursue her career instead of having a family. Subjects were asked to think aloud about events that might have occurred in the fictitious target person's life and to think aloud about the interpretations and evaluations that might be given concerning the target woman's life course.

Table 7: Life Review Simulation Task: An Example

Target Review Age: "old"

Martha, an elderly woman, had once decided to have a family and not to have a career. Her children left home some years ago. One day Martha meets a woman friend whom she hasn't seen for a long time. The friend had decided to have a career and no family. She has retired some years ago.

Task Refrain

This meeting causes Martha to think back over her life. What might her life review look like?
Which aspects of her life might she remember (decisions, problems/solutions, important persons, emotions, positive and negative events)?
How might she explain her life course? Which reasons could she give for her actions?
How might she evaluate her life retrospectively? Has she met her expectations?

Experience with a similar task used in the pilot study suggested that it would be useful to specify certain topics around which the life review should evolve, and to give more clues concerning the structure of a life review. The younger women of the pilot study, in particular, had difficulties with the global instruction of reviewing the target woman's life. To this end, hints concerning the structure of the life review were given in the task refrain (see Table 7 above).

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p = .45); happiness (χ^2 (8) = 12.68, p = .12); mental activity (χ^2 (6) = 3.9, p = .69).

[6] See Appendix A for exact wording of the three life review problems.

The topics family and career were chosen following Berger, Berger, and Kellner's (1974) argument for the existential centrality of these two issues in the typical human life course. In addition, subjects of a life planning study (Smith, et al., in press) had indicated in a questionnaire that family and career were very important domains in terms of life decisions.

Practice Problems: Thinking Aloud and Life Review Task

Thinking Aloud

It was decided to administer the Life Review Task within a thinking aloud framework (Ericsson & Simon, 1984). In addition to some insight into the subject's conscious cognitive processes, the method of thinking aloud[1] also provided a standardizing framework for the interview situation (i.e., subjects expected to soliloquize and not to enter in a dialog). It has to be acknowledged that the implications of the thinking aloud framework vary according to the complexity and ill-definition of the stimulus material. It seems that with increasing complexity of the problem at stake, the "depth" of verbalization in terms of verbalizing meta-level cognitions decreases.

The method "thinking aloud" asks the subject to talk about the thoughts that come to mind while working on a given task. Rather than reporting mental states, subjects report their problem-solving behavior. It is not expected to receive—via the method of thinking aloud—an isomorphic reflection of the subject's thought. It is, however, assumed that possible distortions of thought caused by thinking aloud do not evince age-specific characteristics.

To introduce subjects to the method of thinking aloud, two practice problems were given. The first problem simply asked the subject to name 20 animals. In the second problem, subjects were asked to mentally retrace the route from their homes to a familiar landmark of Berlin (Gedächtniskirche) and give the number of left and right turns they had to make on this trip (see Appendix A for exact wording).

The procedure and problems followed the recommendations of Ericsson and Simon (1984) and previous experiences in the collection of life planning data (Smith et al., in press). While thinking aloud, subjects were not prompted but spoke alone until they indicated that they were finished. Subjects were encouraged to state what they were doing but not to justify why they thought they were doing it. Both problems were very suitable for practicing thinking aloud. Because, at first, subjects usually came up with the answer without having said anything about their problem-solving process while searching for 20 animal names or the number of turns. Consequently, the interviewer's feedback could illustrate what a thinking aloud answer would have been like.

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[1] The method of "thinking aloud" dates back to (among others) Bühler (1907) and Duncker (1935) and is still a frequently used method of data collection in cognitive psychology (see Rowe, 1985). In contrast to most scholars working with introspection (Wundt, 1905) and retrospection (Wertheimer, 1959), Ericsson and Simon (1980, 1984) did not assume to actually gain access to the mind (i.e., isomorphic reflection of thoughts). Rather, the method of thinking aloud searches for a model that best represents mental processes but it also acknowledges that there may be other models that would fit.

Practicing to Review and to Simulate

Two other practice problems were developed to introduce the subject to review and simulation (see Appendix A for exact wording). The two practice problems were constructed as to be similar enough to the Life Review Task (LRT) in order to provide practice for the two processes, review and simulation. However, care was taken to keep the problems different enough to the LRT so that subjects' responses to the LRT would not be anticipated. In the first problem, subjects were asked to imagine a woman who had spent her holidays with her family in one town for many years (holiday problem). Then subjects had to review (recalling events plus further interpretation and evaluation) the woman's history with that town. A second problem devised to practice review and simulation, dealt with a woman who had been a customer with the same clothing store for years (clothing store problem). Subjects were again asked to review the woman's history with that store.

Life Review Questionnaire

A questionnaire about life review (see Appendix A) was administered for several reasons. First, as there is no age-comparative study on the concepts of reminiscence or life review covering the whole life span (Kiernat, 1984), we were interested in comparing the three age groups' understanding of life review (how do they define life review) as well as their use (timing, frequency) of life review and their ideas concerning triggers and functions of life review. Furthermore, questions related to the self-perceived difficulty of personal and of the simulated life review were included.

The questions concerning the self-perceived difficulty of and the self-perceived familiarity (frequency) with life review follow-up on the argument about the ecological validity of intelligence measures (see above Chapter 2, p. 30). Such questions inquire whether life review is a mental activity common to all three age groups in everyday life. Cornelius (1984), for example, asked similar questions about tasks of fluid intelligence measures. He found that older people reported less familiarity with fluid tasks than younger persons and considered them more difficult. It was decided for the present study that a similar assessment of familiarity with and difficulty of life review would provide useful information on performance factors involved when responding to the LRT.

The remaining questions of the inventory provide the opportunity to compare possibly age-specific conceptions (definition, triggers, functions) of life review.

Additional Measures

As it had been argued above, it was expected that the relationship between quality of life review and age might be mediated through variables like (a) intelligence, (b) personality, and (c) life experiences. Age is viewed as a proxy for most of these person characteristics. Measures of such characteristics will be described in the following paragraphs.

Several instruments were selected or developed and tested in the pilot study. The selection or construction of the measurement instruments had to take into consideration that the sample ranged in age from 25 to 75 years, that all subjects were female, and that the amount of time necessary for administration and scoring needed to be as small as possible.

(a) Intelligence Measures

For this study, two aspects of intelligence were of interest. First, a measure of verbal intelligence was necessary because the task heavily relied on the participant's ability to verbalize. By virtue of the selection criteria, subjects were expected not to differ on their verbal abilities.

According to our inspection of possible measures, there were no adequate instruments for assessing the ability to verbalize. Instead, a commonly used measure of semantic knowledge, the vocabulary subtest of the HAWIE (Hamburg-Wechsler-Intelligenztest für Erwachsene; Wechsler, 1964) was chosen. Although the HAWIE was not originally conceptualized for administration across the whole life span, it was later standardized for older adults (Doppelt & Wallace, 1955; Riegel & Riegel, 1959). The completion of the vocabulary subtest on the average took 15 minutes.

Fluid intelligence was another aspect of interest for this study. More specifically, the relationship between fluid intelligence scores and the quality of the life review protocols was of interest. It could provide initial information about the location of the LRT in the "realm" of tasks assessing intellectual functioning.

As a measure of fluid intelligence that is valid and has a relatively short application time, a shortened version of the Advanced Progressive Matrices (APM; Raven, 1971) was chosen. The first 18 items of Set II of the APM were included in the test. This version of the APM takes 15 minutes to complete (speed condition) and has been used before in other projects working with older adults (e.g., Baltes & Willis, 1982; Baltes, Kliegl, & Dittmann-Kohli, 1988).

(b) Personality Measure

With regard to personality characteristics, we were interested in whether and how they may be related to individual differences in quantity and quality of wisdom-related knowledge.

In the light of consistent critiques of personality questionnaires (Angleitner & Wiggins, 1986), the recently developed NEO Personality Inventory (Costa & McCrae, 1985) was selected as the "least evil." The NEO builds on previously collected experiences with personality questionnaires, like the Personality Research Form, the 16 PF, the MMPI or the EPI. Costa and McCrae's goal was to design a test suitable for administration across the adult life span. Their five-factor model of personality is based on studies by Tupes and Christal (1961) and Norman (1963). It has also been confirmed recently by a number of researchers (e.g., Digman & Takemoto-Chock, 1981; Goldberg, 1981). Of particular interest for the purpose of the present study is the cross-cultural validation of the five-factor model with German subjects (Amelang & Borkenau, 1982).

Table 8: Adjective Definers of McCrae and Costa's Five-Factor Model of Personality

Factor	Adjective Definer
Neuroticism	Worrying versus calm
	Insecure versus secure
	Self-pitying versus self-satisfied
Extraversion	Sociable versus retiring
	Fun-loving versus sober
	Affectionate versus reserved
Openness	Imaginative versus down to earth
	Preference for variety versus preference for routine
	Independent versus conforming
Agreeableness	Soft-hearted versus ruthless
	Trusting versus suspicious
	Helpful versus uncooperative
Conscientiousness	Well-organized versus disorganized
	Careful versus careless
	Self-disciplined versus weak willed

Note. Cited from McCrae and Costa (1986).

The NEO Inventory assesses five main personality characteristics. They are: neuroticism (six facets), extraversion (six facets), openness to experience (six facets), conscientiousness, and agreeableness. Table 8 (see above) presents the adjective definers of the five-factor models as reported by McCrae and Costa (1986).

The authors of the NEO were asked for permission to translate the inventory for the purpose of the study.[8] As the results will primarily be used for within-sample comparisons, the lack of German norms was not of disadvantage. To our knowledge, a similarly comprehensive but relatively short personality questionnaire suitable for an age comparison is not yet available in German (see also Baltes & Schmid, 1987).

(c) Biographical Questionnaire

Finally, the past life experiences of a person were assumed to be a possible predictor of the quality of life review.

Most of the existing life event questionnaires have either been developed for a clinical setting (etiology of psychic or psychosomatic illness), for young adults or to assess life events experienced within a short time period (three months to two years). Such instruments do not include the whole range of events likely to be encountered by individuals during their life course.

After inspecting most of the existing and widely used life event questionnaires, the very comprehensive PERI Life Event Scale (Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978) was chosen as a model. Items in the PERI were modified and additional items were written to form a measure suitable for the present study. The modifications were of the following kind: (1) "Childhood" as a domain was added; (2) negative and positive versions of the same event (e.g., changed job for a worse and better one) were combined into one item. This was done because the main interest of the study was whether a subject had experienced an event as important rather than the negative or positive connotations attributed to it; (3) male-specific items (e.g., military service) were removed and female-specific ones (e.g., concerning reproduction) were added; (4) the domain "family" was supplemented by items referring to offspring; (5) the quite rudimentary domain "health" of the PERI Scale was extended to take into account the extended life period covered in the present study and the importance of health as an issue in later adult development. For the most part, additional items came from the FEBL F (Forschungsinstrument zur Erfassung bedeutender Lebensereignisse Form F; Braukmann, Filipp, Ahammer, Angleitner, & Olbrich, 1980). Other life event questionnaires like the Social Readjustment Rating Scale (Holmes & Rahe, 1967) or the Life Event Inventory (Cochrane & Robertson, 1973) were also cross-checked for additional items.

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[8] I thank Dipl. Psych. Connie Holstein for her most valuable help in translating the NEO Personality Inventory.

This modified life event questionnaire was designed as a first attempt to measure the range of important life events experienced by individuals during their life course. Subjects were asked to indicate whether they had experienced the list of 107 events as important for themselves (yes/no), whether they had experienced each event more than once and which of the important experiences caused them to think about their own life or life in general. This additional evaluation of an experienced event was based on the expectation that the experience of an event as important does in itself not necessarily enhance the knowledge about fundamental life pragmatics. Rather, it is expected that the experience had to be succeeded by cognitive restructuring in order to be effective in this respect (see also Oser, Althoff, & Bucher, 1986).

The developed Life Experience Inventory was part of a Biographical Questionnaire.[9] Other items of the Biographical Questionnaire referred to demographic characteristics (years of education, marital status, profession, living conditions etc.) and the transitional character of the subjects' present life circumstances.

Procedure[10]

The measures were administered within a temporal sequence as presented below. Each subject was individually interviewed in German on two occasions, with one to three days separating each session. The interview sessions required about 1 1/2 to 2 hours. Table 9 (see below) summarizes the various parts of the procedure.

The author and two additional female interviewers ($\underline{M}$ = 27 years) conducted the interviews. In order to minimize age-group-specific interviewer effects, each interviewer conducted approximately the same proportion of interviews per subject-age

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[9] The Biographical Questionnaire is available from the author upon request.

[10] See Appendix A for complete instructions and wording of all tasks.

Table 9: Procedure Overview

Occasion	Proceedings
Session 1	Warm-up Conversation Practice Tasks for Thinking Aloud Practice Tasks for Simulation and Review Aspect of Task Life Review Simulation Task[a]
Session 2	Prompting Questions[a] Life Review Questionnaire[a] Personality Measure Intelligence Measures Biographical Questionnaire

[a] Parts of the Interview that were tape-recorded and later transcribed.

and target-age group (i. e., two to three interviews per cell in the design). Good rapport between participant and interviewer was considered very important. The interviewers were, therefore, given one week of training (role play, video, feedback) in interpersonal skills as well as in the application of the Life Review Interview instructions.

Responses to the Life Review Simulation Task (in Session 1) and answers to the prompting questions and the Life Review Questionnaire (in Session 2) were, with subjects' permission (Research Consent Form) tape-recorded and transcribed. A code number was assigned to each subject and any reference to an individual's name was deleted from the transcript.

Session 1

Session 1 consisted of three parts: (a) a warm-up conversation to establish rapport; (b) practice tasks in "thinking aloud," simulation, and review; and finally (c) the Life Review Simulation Task.

(a) Rapport

Pilot work indicated the importance of an initial warm-up phase to establish rapport between participant and interviewer. Thus, the first session began with a casual conversation between participant and interviewer. The goal of this introductory conversation was, on the one hand, to make participants feel comfortable in the situation. On the other hand, the interviewer tried to guide subjects' expectations concerning the study.

In the pilot study, it was often found that participants, especially the younger and middle-aged women, had expected to be asked to talk about themselves. Our experience was that subjects were frustrated when the task did not ask for their own life stories. For this reason, in the main study, care was taken to allow some time for subjects to talk about themselves, either during the warm-up or later during pauses between tasks. In this way, we hoped to keep the subject's frustration as low as possible.

In addition, participants were given a general introduction to the study (without information about the specific research hypotheses). The interviewers said, for example, "that the study investigated knowledge about life that people might accumulate as they go through life." It was emphasized that the task was not to be interpreted as a projective test. This expectation had been a concern expressed by some of the pilot subjects.

(b) Practice Problems

The warm-up conversation and introduction to the study was followed by a number of practice problems. The three (four) practice problems had the objective of familiarizing subjects with the task, checking their understanding of the task, and ensuring that they felt comfortable with doing the task. Two of these problems provided practice in the method of "thinking aloud" (naming 20 animals, retracing a mental map to a familiar landmark; see Materials, p. 100). After each practice task feedback was given (see Appendix A for exact wording).

The final warm-up problem gave practice in review and simulation. Usually, only the holiday task (see Materials, p. 101) was administered for this purpose. Participants were instructed to construct as detailed a review as possible. It was made clear that they should draw primarily on their own experiences when imagining the fictitious person rather than merely describe social norms or stereotypes. Furthermore, they were instructed not to describe only one person they knew, and re-tell this person's life story (see Appendix A for exact wording). For subjects who seemed to have difficulties with this practice task, the clothing store problem (see Materials, p. 101) was also provided to further ensure their understanding of the task.

(c) Life Review Simulation Task

The practice problems were followed by an introduction to the Life Review Simulation Task, which explained in everyday terms how life review was understood in this study and gave some guidelines for solving the task. These guidelines, similar to those provided for the last practice problem, referred to constructing a detailed review of a fictitious woman's life. Subjects were asked to think of events in the fictitious woman's life, to try to explain and evaluate those events. In doing this, participants were again instructed to draw, as far as possible, upon their own knowledge rather than on social stereotypes, and to refrain from just re-telling the life story of one person they knew (see Appendix A for exact wording).

In order to test the participant's comprehension of the task instructions, each subject—after the interviewer's explanations of the task—was asked to describe her understanding of what she was supposed to do. If the subject did not mention all aspects of the instructions, the interviewer read a list of items and asked the subject to identify which of these items were also mentioned. Thus, the criteria for the subject's understanding of the task included a free recall and a recognition test.

Experiences in the pilot study had suggested the necessity of preparing several *standard interventions.* When a subject's entire response had just referred to the woman's present situation and had not mentioned the woman's past life, the following instruction was given: "So far you have described the subject's present situation, could you now also try to think which events that woman might recall when she reviews her life." If this first intervention did not elicit more information, the standard questions of the task refrain were repeated. Together with the prompting questions which will be described in Session 2, these interventions were introduced to determine whether the subject did not say more because she did not understand the task, did not like to speak alone, appeared unmotivated, or whether she did not know more about the fictitious woman's life.

After each subject had finished responding, she was again asked to recall the wording of the task. The answer (or better its omissions) may be of use in relation to a content analysis of the protocols. The omissions can be interpreted as one indicator for why the subject's response did not cover certain life domains or certain phases of the fictitious woman's life. Finally, subjects were asked how they went about solving the task, to remember the main points of their answer and to indicate which knowledge source they had primarily used for constructing the life review (own life, life of known others, knowledge gained through media). The administration of the Life Review Simulation Task concluded the first session.

Session 2

In the second session, subjects were first asked to recall and to summarize the life review constructed during the last session. Having revived the constructed life review, questions probing the subject's response to the Life Review Simulation Task were asked. These prompting questions were derived from the six wisdom-related criteria (good advice, rich knowledge about life, good life review, contextualism, relativism, awareness of uncertainty) which were used to analyze the protocols.

The prompting questions referred, for example, to setting priorities concerning the life events mentioned, to possible alternative life courses, to the woman's goals and to possible important influences on the woman's life (see Appendix A for exact wording). The prompting questions were meant to provide a possibility for subjects who did not feel at ease with the spontaneous thinking aloud to show some more of their knowledge about fundamental life pragmatics. As a consequence, some subjects' answers to the prompting questions may contain additional information about subjects' wisdom-related knowledge.

The prompting questions were followed by the Life Review Questionnaire (see Appendix A). Subjects responses were tape-recorded. Session 2 was concluded by the administration of the intelligence measures, the personality measure, and the Biographical Questionnaire.

Data Preparation and Scoring

Table 10 (see below) provides an overview of the data collected in the present study: (1) life review protocols (transcripts of responses to LRT); (2) responses to standard

Table 10: Summary of Variables Used in the Study

Source	Variable	Function
Trained Judges' Ratings of Life Review Protocols	Good Advice Rich Knowledge Good Life Review Contextualistic Thinking Relativistic Thinking Awareness of Uncertainty	Quality of Response to Life Review Task
Counted Words of Verbatim Protocols	Total Number of Words Spoken	Control for Covariation with Quality of Response
Biographical Questionnaire	Years of Education Transitional Character of Life Circumstances	
HAWIE Vocabulary Subtest	Verbal Intelligence	
APM (shortened version)	Fluid Intelligence	Performance Factors Involved in Response to Life Review Task
Question after Response to Task	Primary Knowledge Source	
Life Review Questionnaire	Difficulty of Task Difficulty of Personal Life Review Frequency of Life Review	
Life Experience Inventory	Number of Life Experiences Number of Life Experiences Reflected upon	Subject Characteristics (Alternative Predictors of Quality of Response)
NEO Personality Questionnaire	Extraversion Openness Kindness Agreeableness Conscientiousness	

psychometric instruments; (3) responses to questions and questionnaires developed for the study. The three data sources were not of equal importance to the present study. The life review protocols formed the focus of interest: For this reason, methods of data preparation and scoring of the responses to the Life Review Task will dominate the discussion.

Preparation of Life Review Protocols

Exactly transcribed protocols of responses to the Life Review Task were proof-listened and the unprompted (spontaneous) as well as the prompted answers were timed and divided into 30-second-segments. To assess the total number of words spoken, two measures of protocol length were recorded: total time and average number of words per minute.

To calculate the average number of words, the number of words spoken during every fifth minute was counted. The calculated average number of words spoken was multiplied by the total time in order to compute the total number of words spoken. A complete word count was taken for two subjects in each age group in order to check this method. As both results were not substantially different, the average number of words spoken was estimated using the sample counts.

Method for Scoring Life Review Protocols

Selection of Method

In selecting the method used for the analysis of the life review protocols, the following criteria were taken into account: (1) characteristics of the available data set; (2) consistency with the theoretical framework elaborated above; (3) limitations imposed on the study through available time and money.

The methodological considerations were constrained by the characteristics of the available data. We were presented with a set of verbal data. Consequently, the central issue was to reduce and quantify the information contained in the protocols, while at the same time striving for an optimal reflection of the quality of the protocols.

To reach this goal, two alternatives discussed in the literature were considered (e.g., Bortz, 1984; Jüttemann, 1985; Rust, 1983). One option involves the widely used and rather microanalytic evaluation of protocols through content analysis[11] (e.g., Huber & Mandl, 1982; Krippendorff, 1980). The latter, less obvious possibility is the more macroanalytic procedure of rating the whole protocol along certain evaluative dimensions (e.g., Clauss, 1968; Langer & Schulz v. Thun, 1974). It is a less obvious possibility in this context because ratings have been used mostly in behavioral observation research (e.g., Cairns & Green, 1979) or as self-report measures in research on attitudes (e.g., Dawes, 1972).

Following from the three selection criteria (see above), the present study focused on evaluating the quality of responses to the Life Review Task at a global level. Thus, rating the protocols was chosen as scoring method. To this end the wisdom criteria of Baltes and Smith (1987) were used as a basis to develop rating scales and raters were trained to use these scales to assess the quality of each response.

As outlined in Chapter 2, the fundamental pragmatics of life are considered an ill-defined knowledge domain. Consequently, so far no exhaustive definition of expert or high-level performance in this knowledge domain exists. It is, however, assumed that within a given society consensus can be reached concerning this expertise (i.e., wisdom; Baltes & Smith, 1987). The use of trained judges to rate the quality of the protocols is one way to operationalize this consensus idea of wisdom.

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[11] Content analysis here refers exclusively to the coding of text elements according to certain categories. In the literature, this notion is sometimes also used in a wider sense to denote any analysis of verbal documents (e.g., Rust, 1983).

Rating as Method of Data Analysis

Although rating is a widely used and appreciated method in the social sciences, it is also a widely criticized one. The main criticism refers to the allegedly high degree of subjectivity and the lack of differentiation which are supposedly associated with low reliability and validity (Langer & Schulz v. Thun, 1974). One should be careful, however, with a global condemnation of the method of rating; costs and benefits should be carefully weighed against each other for any study under attack. Especially if complex, often ill-defined characteristics are to be assessed, rating has proved to be an adequate tool for data analysis.

Three components are involved in the rating process. The object or person which is to be rated (ratee), the rating criterion, and the rater. For the present study, the respective components are the life review protocols, the criteria of expertise in the fundamental pragmatics of life and the life-experienced rater. Rating draws on the ability of the human mind to integrate manifold and complex observations into one judgement. It pays for this "exploitation" by loss of so-called objectivity, because the rater with his/her information processing system and his/her personality influences the rating score, in addition to the characteristics of the object or person to be rated.

With regard to the reliability and validity of rating data, a number of rating errors are discussed in the literature (e.g., Saal, Downey, & Lakey, 1980; Bortz, 1984): halo effect, central tendency, leniency-severity error, rater-ratee-interaction, and primacy-recency effect. It has been suggested that these errors can be alleviated by informing raters about them beforehand (e.g., Bernardin & Walter, 1977; Latham, Wexley, & Pursell, 1977). In general, problems of reliability and validity can be minimized by investing effort in scale development (definition, application rules) and rater training. The efforts undertaken in the present study are described in detail below.

Rating Criteria

The five wisdom-related criteria (Baltes & Smith, 1987) were used as a basis for developing six rating scales. In addition, the conceptualization of the scales was informed by the theoretical considerations about life review, as presented above, and the inspection of the pilot protocols. The following six wisdom-related dimensions were developed for rating the quality of the life review protocols:

1. good, insightful judgement and advice about difficult life problems;
2. rich knowledge about fundamental life pragmatics;
3. rich knowledge about life review;
4. contextualistic thinking;
5. relativistic thinking;
6. thinking that acknowledges the uncertainty of life.

The first three of these six dimensions refer to more general aspects of expertise in the knowledge domain "fundamental pragmatics of life," whereas the final three address the more specific and refined aspects (heurisms) related to that expertise. Each wisdom-related dimension encompasses declarative and procedural knowledge components.

Below you will find the complete wording of the developed rating scales (for the original German version see Appendix C).

1. *Good, insightful judgement and advice about difficult life problems*

   Some people seem to have special insight and good judgement in reference to difficult life problems. When asked for advice this enables them to give useful and meaningful tips. After having read the protocol, please try to consider it as a whole. To what extent does the person who produced this protocol give the impression of having insight into and secure judgement about difficult life situations and to be thus able to give good advice about ways of dealing with difficult life problems?

2. *Rich knowledge about life pragmatics*

   Some people seem to be very knowledgable about "the background issues of life." This background knowledge refers, for example, to:
   - knowledge about the human condition, such as mortality, aging, vulnerability, emotionality, contextual embeddedness;
   - self-knowledge, such as being aware of one's own assets and liabilities, knowing one's goals, knowing one's reactions;
   - knowledge about human relations, such as how people react under specific circumstances, the range of people's goals, the influences others can exert on a person's life;
   - knowledge about societal rules and their importance for a person's life; but also knowledge about the limits of this influence, i.e., which rules one has to comply with and from which rules, under which circumstances one can deviate from for one's own sake.

   To what extent is rich knowledge about fundamental life pragmatics (i.e., knowledge about the human condition, self-knowledge, knowledge about human relations, knowledge about societal rules) recognizable in the protocol?

3. *Rich knowledge about life review*

   Some people seem to have rich knowledge about how to review a life, how to make sense of a life. They are able to conclusively reconstruct the life course. Furthermore, they can interpret and explain how this life course came about and, finally, they are able to retrospectively evaluate the constructed life course.

   To what extent is rich knowledge about life review (i.e., conclusive reconstruction, interpretation, and evaluation of Martha's life) recognizable in the protocol?

4. *Contextualistic thinking*

   One very important aspect of good judgement about difficult life problems is contextualistic thinking rather than considering a person or situation in isolation. By contextualistic thinking we mean that one considers, for example, where the person lives, which family she comes from, which life domains play a role in her life (family, work, leisure etc.), who are her friends, where does she work etc. As there is a great number of potentially important contexts, it also is part of contextualistic thinking to decide which of the contexts are the most important ones for a specific problem, for a specific life.

In this respect, it is not enough to consider the interplay between various aspects of life in their importance for the *present* life conditions. Furthermore, the effects of this interplay for the *future* and the history of the interplay in the *past* have to be taken into account.

Such an interplay always has the potential to give rise to tension and conflict. Thus, contextualistic thinking also includes the ability to recognize how the importance of these aspects varies throughout the life course and how such conflicts can be resolved by setting priorities for a given point in time.

To what extent is contextualistic thinking, which realizes the important past, present, and future background contexts of a life problem and how these are to be coordinated with each other, recognizable in the protocol?

5. *Relativistic thinking*

   One important aspect about good judgement in difficult life problems is to think in a relativistic way. This means that one considers how dependent decisions and whole lives are on the *values* of a person, the values of the person's associates and of the society which the person lives in. One is able to match different decisions to different types of people and different cultural circumstances. For difficult life problems there is only very rarely *one* decision which is "true" in general. Nevertheless, one can come to a decision if, among other things, the person's values are taken into consideration.

   In addition, relativistic thinking refers to the ability to abstract from one's own experiences and values, instead of rigidly and dogmatically insisting upon them. This also includes the willingness to try to understand and to accept other attitudes.

   To what extent is relativistic thinking, which realizes that life decisions and life courses can only be judged upon relative to a particular person and which, instead of being dogmatic, can consider values and priorities alternative to one's own, recognizable in the protocol?

6. *Thinking that acknowledges the uncertainty of life*

   One important aspect about good judgement in difficult life problems is to consider the various uncertainties connected with the problem. This means that one has realized how limited one's own knowledge concerning life is and will always be, but that nevertheless one has to make decisions and has to be able to deal with the unexpected.

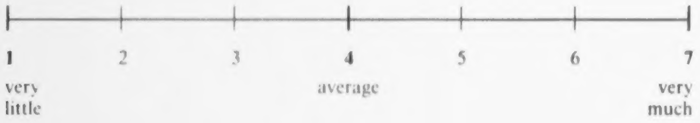
   The acknowledgment of the uncertainty of life includes the insight that it is neither possible to clarify every detail of the history of a life problem, and of its present state nor is there a perfect prediction of future development. Thus decisions, once made, have to be reconsidered according to ever-changing circumstances and have to be modified, if necessary. Acknowledging the uncertainty of life makes one aware of the possibility of change and enables one to constructively deal with it.

   To what extent is thinking that acknowledges the uncertainty of life, that is realizes that there is no perfect knowledge about the past, the present or the future in life but that nevertheless one has to live and make decisions, recognizable in the protocol?

Scale Construction and Application[12]

The aim was to construct "elaborate scales" (Langer & Schulz v. Thun, 1974) which would provide the basis for "concept-oriented rating" rather than "intuitive rating." Langer and Schulz von Thun (1974, p. 127) proposed that for a scale to be called "elaborate," the following three materials have to be provided: (1) *description of the dimension* which describes, explains, and defines the dimension; (2) *application rules for scale points* which establish the relation between the scale points and the rater's varying impressions of the ratee; (3) *examples* which illustrate the dimension in its different expressions. Consequently, the following materials constitute an elaborate wisdom-related scale: the description of the dimension, the application rules for three scale points, and example sentences of the ideal protocol which was discussed with raters during training.

For scale construction, first, a seven-point rating scale was attached to each of the six wisdom-related dimensions described above. Three of the seven points were labelled and described as anchor points.



Number of Scale Points

A review of the methodological literature concerning the construction of rating scales suggested either a five-point (Lissitz & Green, 1975; Rohrmann, 1978) or a seven-point scale (Cicchetti, Showalter, & Tyrer, 1985; Green & Rao, 1970) as optimal in balancing reliability and differentiation. Two reasons spoke for the seven-point solution. First, experiences in a study on life planning (Smith et al., in press)—using similar wisdom-related rating criteria—had shown that raters seemed to be able to differentiate the quality of protocols on a seven-point scale. The second argument in favor of the finer differentiation was research-pragmatic. If score distributions showed that only five or less scale points had been used by the raters, it would be possible to collapse scale points afterwards.

Verbal Descriptors of Scale Points

The central importance of adequate scale point descriptors has often been emphasized and criticized as lacking in many studies (e.g., Lindzey & Aronson, 1968; Sixtl, 1967). The adequate scaling of a criterion is the pre-condition for meeting the requirements of statistical techniques later used for the analysis of rating scores.

Adequate verbal descriptors should have two characteristics: The semantics should be unambiguous and they should reflect as far as possible equal distance between the numeric descriptors. Rohrmann (1978) conducted a "calibration" study for German verbal descriptors. For intensity ratings the five labels "gar nicht, kaum, mittelmäßig, ziemlich, außerordentlich" were found to meet the postulated characteristics. A very recent study by Tränkle (1987) demonstrated, however, that verbal descriptors alone should not be overestimated in their importance for the metric qualities of a scale. Results of the study raised doubts concerning the equidistance of the scale descriptors reported by Rohrmann (1978). Rather, it was suggested that graphical and numerical presentation of scale points are of at least comparable importance as verbal descriptors with regard to attaining equidistance of scale points. As a consequence, in the present study three scale points were finally labelled and the scale was also presented graphically and numerically (see above).

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[12] See Appendix C for a complete survey of rating tools, i.e., scale descriptions, application rules, and example sentences of an ideal protocol for each dimension.

General Rating Design

Several issues were considered in deciding the overall design for rating the life review protocols: number of raters, whether to have independent ratings for each scale or to have all raters use all scales, and the sampling of raters. Which approach optimized data quality and yet was still practicable in terms of time and money?

Considering the literature on rating errors, especially the halo effect, it was decided to have every rater judge the protocols on one dimension only.[11] In order to be able to calculate a reliability coefficient, two raters were assigned to each wisdom-related dimension resulting in a total of 12 raters. To do this, the median age was calculated across the 12 raters and the group was split into two subgroups using the median as cutting point. Six rater pairs were formed by randomly selecting one rater from each subgroup. The six pairs were then again randomly assigned to the six wisdom-related dimensions.

Rater Sampling Criteria

It was decided that all raters would be women who had professional backgrounds and met several criteria of expertise in the knowledge domain fundamental pragmatics of life. The selection of all female raters was in keeping with the framework of the whole study which only had female participants.

What kind of women were chosen to fill out the rating design? The following criteria of expertise in fundamental life pragmatics were devised. Women were considered to qualify to participate as an "expert" rater if they had:

- experienced and reflected upon a considerable number of critical life events;
- coped with difficult life situations;
- everyday-contact with many different lives and had also thought about these lives;
- been asked for advice or mediation;

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[11] The alternative would have been to have every rater judge the protocols on all scales and have a counterbalanced design for scale administration. This solution, however, would call for many raters and a considerably larger amount of time per rater.

- worked in a profession that furthered and implied such experiences such as those mentioned above, for example personal management, law, the caring professions, or journalism.

Chronological age in itself was not a selection criteria.

Rater Screening

The rater sampling criteria, outlined above, were used as a guideline for formulating a newspaper advertisement which described the establishment of an "expert" panel. Applicants were asked to apply by telephone. After a first, crude screening by means of a telephone conversation, applicants were invited for a group discussion. Twice as many women (N = 24) as were needed for the rating were invited.

Three group discussions with eight participants each were used as a further step in the selection procedure. The three group sessions were video taped. After each participant had introduced herself to the group, a discussion directed by the author centered around two main purposes: on the one hand, the need to offer the applicants information about their role in the project (i.e., read and rate 63 protocols); and on the other hand, the need to collect further information about the applicants to aid our selection process.

It seemed important to make sure that the applicants knew the requirements of their task before they took part in the labor-intensive rater training: We hoped to prevent drop-outs later. To this end, at the beginning of the discussion, the potential raters were informed about the general nature of the study and about the "genesis" of the protocols they would be rating. This information was given without mentioning the hypotheses of the study and without mentioning the concept "wisdom."

Second, in order to assess the "expertise" of the applicants, the potential raters were themselves asked to discuss a life review problem which had been used in the pilot study. In addition, they were asked to rate five protocols from the pilot study on two dimensions similar to but not identical with the wisdom-related dimensions.

Selection Procedure

The video recordings of the group discussions were later rated by four members of the wisdom project. Each applicant was scored on three wisdom-related dimensions (good advice, rich knowledge, relativistic thinking)[14] and one dimension relating to task orientation. This last dimension was defined in terms of qualities such as paying attention to and understanding explanations, willingness to do the task as it was described and not as the applicant herself might have conceived it. The 12 applicants rated highest on all scales were selected as the final rater panel.

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[14] The selection of these scales was guided by two criteria: First, the dimensions should be relevant to the task of rating the protocols; and secondly, it had to be taken into consideration whether it was possible to judge on the dimension by means of the video recordings.

Description of Rater Panel

After the selected applicants had agreed to work with the project, these 12 raters were invited for a "testing session." During this session, instruments which enabled us to describe our rater population were administered as group measures. The instruments assessed verbal (SASKA; Riegel, 1967) and fluid (RAVEN) intelligence, personality characteristics (two scales of the NEO) and life experience (Biographical Questionnaire, as developed for the study).[15] Table 11 (see below) summarizes the characteristics of the rater panel in comparison to the subjects.

Table 11: Characteristics of Rater Panel (in comparison to subjects)

Variable	Raters	Subjects
Age		
Mean	49.58	49.35
SD	8.65	15.79
Range	38–62	26–73
Years of Education		
Mean	20.83	17.64
SD	2.13	3.62
Range	17–24	11–25
Verbal Intelligence[a]		
Mean	86	76
Range	70–97	60–92
Fluid Intelligence[b]		
Mean	12.75	10.87
SD	3.33	4.48
Range	6–18	2–18
Number of Life Experiences		
Mean	38	34
SD	8.5	9.23
Range	22–54	8–57
Number of Life Experiences Reflected Upon		
Mean	19.67	13.59
SD	9.59	6.92
Range	8–41	0–39
Neuroticism[c]		
Mean	74.58	82.51
SD	17.57	27.9
Range	47–100	23–152
Openness[c]		
Mean	141.33	132.87
SD	14.4	16.93
Range	123–164	91–174

[a] Percentile Ranks.

[b] Maximal raw core: 18.

[c] Maximal raw core: 192.

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[15] If not indicated otherwise, reported results refer to raw scores.

The average age of the raters was comparable to those of the subjects ($\underline{M}_{\text{raters}} = 49.58$ years; $\underline{M}_{\text{subjects}} = 49.34$ years). Similar to the subject group, the raters had an above average verbal score.[16] On the average, raters had three more years of education than the subjects ($\underline{M}_{\text{raters}} = 20$ years; $\underline{M}_{\text{subjects}} = 17$ years) and were higher in fluid intelligence ($\underline{M}_{\text{raters}} = 12.75$; $\underline{M}_{\text{subjects}} = 10.9$). They had a higher number of important life events ($\underline{M}_{\text{raters}} = 38$; $\underline{M}_{\text{subjects}} = 34$) as well as a higher number of experiences which had caused them to reflect upon life ($\underline{M}_{\text{raters}} = 20$; $\underline{M}_{\text{subjects}} = 14$). The raters' average neuroticism score (a subscale of the NEO) was below the population average according to standardized scores and it was lower than the subjects' average score ($\underline{M}_{\text{raters}} = 74.58$; $\underline{M}_{\text{subjects}} = 82.51$). For the openness score (subscale of NEO), the same was true, but in the opposite direction ($\underline{M}_{\text{raters}} = 141.33$; $\underline{M}_{\text{subjects}} = 132.87$). The raters were on the average above the standardized average score and their score was higher than the average subjects' score.

In sum, these data seem to describe a rater sample that is psychologically healthy, rather open to new experiences, above average in intelligence, and quite experienced with life matters.

Rater Training[17]

The individual training for each rater pair consisted of (a) a general, and (b) a scale-specific part. In total, the training session took about 4 hours.

(a) *General training.* The training session began with an introduction to the method of rating in everyday language, and explanations concerning the most common rating errors (e. g., Bernardin & Walter, 1977; Saal et al., 1980). Secondly, general rating tasks followed which were designed to accustom raters with the use of the seven-point scale and with evaluating texts on relatively complex dimensions. The completion of the first task was followed by a discussion with raters stressing the importance of using the full range of the scale. Feedback to the second task (see Appendix B) emphasized the importance of being aware that text characteristics like length, style or kinds of opinions uttered easily influence the judgement, even though they may not be relevant to the present criterion. Raters were instructed to attempt, as far as possible, to evaluate the quality of the life review protocols regardless of such text characteristics.

Since the selected raters were already familiarized with the Life Review Task and with the method of thinking aloud, little time was devoted to this in the general training. Rather, instructions focused on reminding raters about particular characteristics of the life review protocols, such as the presence of grammatical inaccuracies or incoherent strings of thought. Such characteristics ask for extra effort on behalf of the reader in order to understand the text.

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[16] The vocabulary subtest of the HAWIE used with the subjects is not suitable for group administration. Thus, two subtests of the SASKA were chosen for the assessment of the raters. For the comparison between the two scores, percentile ranks of raw scores were computed.

[17] See Appendix B for training instructions, training tasks, and sample protocols used for exercise during training.

(b) *Scale-specific training.* The scale-specific second part of the training consisted of the introduction and discussion of the respective rating dimension. Raters were provided with a detailed description of their scale (see Appendix C) and were asked to discuss its application in the context of the Life Review Task. Specifically this discussion was directed towards the construction of an ideal protocol in terms of the respective wisdom-related dimension. Since differences among the three target-review ages primarily refer to historical time and number of life events, only one ideal protocol was constructed. Variations related to target-review ages were discussed in the course of the construction process.

Raters were also given rules for applying the seven-point scale onto their dimension (see Appendix C). To assess the understanding of these rules, raters were asked to score two modified sample protocols from the pilot study on the respective dimension. The scores assigned by each rater and the scoring process was then discussed. Feedback concentrated on the raters' understanding of the scale, focusing their judgement exclusively on the respective scale, and rating the protocols against an ideal rather than rank-ordering them.

After the training, each rater had three rating tools at hand for her scoring: the description of the dimension, the application rules for three scale points, and example sentences of the ideal protocol.

Specific Rating Procedure

Raters were asked to compare each protocol against an ideal protocol rather than to rank-order them. Specifically, raters were asked to judge the degree of similarity with the "ideal" (wise) protocol. Since we did not expect a high frequency of "wise" protocols in our sample, rank-ordering would have lowered the criteria for a response to be scored seven on the respective wisdom-related scales. In addition, the comparison against an ideal protocol probably reduced the severity of a number of possible rating errors, for example, sequence effects or rating distortions because of the rater's own standing on the scale.

Only the unprompted responses to the Life Review Task were included in the rating. A random sample of 18 prompted responses (2 for each cell of the design) was inspected by the author in an exploratory fashion.

After the training, raters obtained the protocols in packages of 21 each. The protocols were grouped by target-review age (see Table 12 below). All life reviews constructed for the young, middle-aged, and old targets respectively formed into a group. Within target-review age the sequence of protocols, that is subject ages, were randomized. The grouping of protocols according to target-review age seemed adviseable in order that the raters may be able to establish a frame of reference (ideal protocol) for each problem type. This would have been impossible with, for example, a total randomization of protocols across subject *and* target-review age.

With two raters per dimension, sequence effects could not be perfectly counterbalanced.[18] Within each pair, however, one rater began with the package "young

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[18] A perfectly counterbalanced design would ask for six raters per scale ($3! = 3 \cdot 2 \cdot 1 = 6$). Considerable effects of position within the sequence of rating could be excluded, however, as the average reliability

Table 12: Scoring Design

Rater No.	Scale	Sequence of Protocols[a]		
1	Good Advice	Young Target	Middle-Aged Target	Old Target
2		Old Target	Middle-Aged Target	Young Target
3	Rich Knowledge	Young Target	Middle-Aged Target	Old Target
4		Old Target	Middle-Aged Target	Young Target
5	Good Life Review	Young Target	Middle-Aged Target	Old Target
6		Old Target	Middle-Aged Target	Young Target
7	Contextualistic Thinking	Young Target	Middle-Aged Target	Old Target
8		Old Target	Middle-Aged Target	Young Target
9	Relativistic Thinking	Young Target	Middle-Aged Target	Old Target
10		Old Target	Middle-Aged Target	Young Target
11	Awareness of Uncertainty	Young Target	Middle-Aged Target	Old Target
12		Old Target	Middle-Aged Target	Young Target

[a] Within target review age (young/middle-aged/old) the 21 protocols (7 of each subject-age group) were randomized. The rating of each package of 21 protocols was done within about one week.

target" and the other began with the package "old target." For both raters the package "middle-aged target" had the middle position. Thus, the following and preceding target age differed for all three targets. However, only the young and old targets in addition changed their position in the scoring process.

The rating was done at home. For each package of 21 protocols, the raters had one week to complete the rating. In order to keep some control concerning the raters' working behavior, each rater obtained a comment sheet with each package of protocols (see Appendix C). On this sheet raters were asked to indicate the date of rating and

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coefficients of the young and old target ($\underline{r}_{(young)}$ = .82; $\underline{r}_{(old)}$ = .86) were as high or higher than the one for the middle-aged target ($\underline{r}_{(middle\text{-}aged)}$ = .82) which had remained in the middle position for each rater.

the time they took for rating each protocol. In addition, they could use a column for extra comments concerning a protocol.

The rating of all 63 protocols took on the average about 27 hours per rater (25 minutes per protocol). Rating times per protocol slightly decreased after the first round of rating ($\underline{M}_{first}$ = 26 minutes; $\underline{M}_{second\ \&\ third}$ = 24 minutes). Considering target-review ages, it was the young target that on the average took a few minutes longer to be rated ($\underline{M}_{young}$ = 27 minutes; $\underline{M}_{middle\text{-}aged\ \&\ old}$ = 24 minutes).

Raters were paid 1.000 DM for their work. This considerable amount of money was meant to stress the importance and seriousness of the rating. Raters should understand themselves as working members of the project.

After all raters had completed their rating, we met for a final group discussion. Several objectives were pursued by this meeting. First, raters were thanked for their reliable and engaged work for the project. Second, they were asked to fill out a final questionnaire. The questions referred to their assumptions about the hypotheses underlying the study, their recollection of the wording of the rating scale they had used, and finally their own practices concerning life review. Third, they were informed about the study (hypotheses, design, all scales) and their experiences and criticism were discussed.

The raters' recollection of the wording of their respective scales showed that they had picked up the central points of the scale descriptions. In addition, the common understanding reached through the training seemed not to be altered in the process of rating the 63 protocols. The raters' assumptions concerning the hypotheses underlying the study did mainly focus on the three target ages (e. g., today's women's expectations concerning biographies of women differing in age, historical change of female biography), on descriptive aspects (e. g., what is life experience?, how can it be described?), and on the raters themselves (e.g., how does a rater's life course relate to her judgements?). Only one rater assumed that the study was interested in the knowledge about the life of women at different ages. In sum, these answers allow the conclusion that raters were blind to the main hypotheses of the study and had used the wisdom-related dimensions according to our definitions.

Method for Scoring Other Measures

Standard Psychometric Instruments

As far as standard psychometric instruments were concerned (i.e., the vocabulary subtest of the HAWIE, the tasks selected from the RAVEN, and the NEO questionnaire), scoring was done according to the instructions given in the respective manuals. Except for the general description of the sample, raw scores were used for further statistical analyses because we were primarily interested in a comparison between the three age groups within our sample. A standardization of raw scores by means of age norms would even out the interesting, that is age-related effects.

Thus, the scales neuroticism and openness to experience of the NEO were used to gain an impression about the psychological health or the openness of the sample (as well as the raters) in comparison to an average population. Before the American norms of the NEO were applied, it had been checked that means and standard deviations of the present sample did not differ from those of the population used for standardization by Costa and McCrae. In terms of verbal intelligence, the raw scores of the vocabulary test of the HAWIE were first converted into standard scores which then were transformed into IQ scores by using age-specific means and standard deviations as reported by Doppelt and Wallace (1955). In a similar way, the raw scores of the APM (shortened version) were transformed into IQ scores.

Questions and Questionnaires Developed for the Present Study

Four additional data sources were analyzed: the Life Experience Inventory, responses to follow-up questions which referred to life changes in the near past and near future, subjects' responses to a question asking about the primary knowledge source they had used in responding to the Life Review Task, and the Life Review Questionnaire.

(1) *Life Experience Inventory.*[19] Three sum scores were available from the Life Experience Inventory: number of life events experienced as important, number of important life events experienced more than once, and number of life events that had caused reflection upon life.

For statistical analyses, only two of the three scores were used. The score for important events that had occurred more than once was eliminated since few subjects had marked this category.

(2) *Transitional character of life circumstances.* Two dichotomous scores were available from respective items of the Biographical Questionnaire. One referred to change in the near past (yes/no) and one to change in the near future (yes/no). As our interest lay in the general transitional character of the subject's present life circumstances, these two scores were added for statistical analyses. The resulting aggregated score had three levels which were rank-ordered according to increasing degree of transitional character: no change at all, change in either the near past or the near future, change in both the near past and the near future.

(3) *Primary knowledge source of response to Life Review Task.* The question referring to the primary knowledge source was posed after the subject had completed her response to the Life Review Task. Answers to this question were open-ended though the interviewer had offered a list of possible knowledge sources as a guideline (see Appendix A for exact wording). The answers to this question were part of the verbatim transcriptions.

Initially, two scorers independently coded the answers according to three preliminary categories: (1) own life, (2) life of known others, (3) impersonal knowledge sources (movies, books, social stereotypes). After the first run through, this category system was modified slightly. The first two categories remained the same and two new categories, each combining two of the original ones, were introduced. Consequently, the final category system included four categories: (1) own life, (2) own life and life of known others, (3) life of known others, and (4) impersonal knowledge source and life of known others. These four categories were rank-ordered according to an increasing degree of impersonality of the knowledge source employed.

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[19] The Life Experience Inventory is available from the author upon request: Max Planck Institute for Human Development and Education, Lenzeallee 94, 1000 Berlin 30

In a second round of coding, the two scorers independently applied the new categories. In 10 cases out of 63 the coders disagreed. These 10 cases were discussed until agreement was reached.

(4) *Life Review Questionnaire.*[20] Three of the 12 questions of this questionnaire were scored for further statistical analyses. Two referred to the self-perceived difficulty of the Life Review Task and of personal life review respectively, and one question asked about the subject's frequency of engaging in life review. The remaining nine questions were evaluated in an exploratory fashion by summarizing the content in terms of the definition, functions, and triggers of life review.

Each of the three questions which were quantitatively analyzed, was again independently scored by two coders on three categories. For the two questions about the difficulty of the Life Review Task, the categories were: high, average, and low difficulty. For the frequency question, they were: above average, average, below average. The coding procedure followed the one described above for the question concerning the primary knowledge source.

Summary

To summarize, three kinds of data were available in the present study, the ratings of the responses to the Life Review Task, scores on standard psychometric instruments, and responses to questions and questionnaires developed for the study. These data were used to serve four purposes (see also Table 10 above).

In particular, scores on the six wisdom-related scales formed the central data set indicating the quality of subjects' performance on the Life Review Task. Control measures included: total number of words spoken, years of education, verbal intelligence score, and transitional character of life circumstances.

A selection of possibly relevant performance factors involved when responding to the Life Review Task were captured by questions, such as: What was the primary knowledge source informing the response?, How does the difference between subject and target-review age influence response quality?, How does the quality of response relate to scores on fluid intelligence measures?, How much experience did subjects have with life review?, How difficult did they experience the task to be?

Finally, a first attempt was made to investigate a number of subject characteristics in their relation to the quality of responses: four scales of the NEO (extraversion, openness, agreeableness, conscientiousness), number of important life experiences, and number of life experiences reflected upon. The selected subject characteristics partially explicate chronological age but also capture subject features not necessarily related to age.

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[20] See Appendix A for exact wording.

Chapter 6
Data Analysis and Results

Overview

First, the reliability of the trained judges' ratings will be discussed. Without an acceptable level of inter-rater agreement conclusions regarding the various hypotheses would be tenuous at best. Second, the number of "wise" protocols within the pool of present responses is determined. Subsequent analyses have to be interpreted within the range of response quality present in the sample.

Third, the general hypothesis that older adults would be judged as giving higher quality responses to the Life Review Task is investigated. Subsequent analyses test for the existence of general age-specific expertise, as well as age-specific expertise qualified by rating criterion and/or target-review age. Fourth, the data are examined to assess the role of other variables (covariates) in relation to judged response quality. Included in these analyses are possible effects due to total number of words spoken during the response, subjects' education, subjects' verbal intelligence. The transitional character of subjects' present life circumstances will also be discussed. The analyses associated with possible age differences in response quality constitute the primary focus of the present work. The remaining analyses are meant to provide a larger framework for this central set of results.

To provide this larger framework, a fifth group of analyses will deal with possible performance factors involved when responding to the Life Review Task. Is it, for example, easier to do a life review for a character close to one's own age rather than at an age extreme? Are reviews for an age group younger than oneself (retrospective) easier to construct than reviews for an age group older than oneself (prospective)? Further, to what extent are personal sources of information used to construct reviews rather than impersonal (e. g., mass media) sources, and how do these two knowledge sources relate to subject age, target age, and response quality? Discussion in this section will also focus on the relationship between quality of response to the Life Review Task and (a) intelligence scores, (b) scores of self-perceived difficulty, and (c) reported frequency of personal life review.

Finally, following the proposal that chronological age is but one of a set of predictors of expertise in the domain "fundamental life pragmatics," and not necessarily the best, several other predicting variables are investigated with regard to their predictive power of the quality of responses. Measures of life experience and personality are used in these exploratory analyses.

Inter-Rater Agreement (Reliability of Ratings)

To investigate the extent of inter-rater agreement in scoring wisdom-related criteria, correlation coefficients for the six pairs of raters were computed. The coefficients ranged from Cronbach α .70 to .82 (see Table 13 for summary of inter-rater agreements). The Kendall Coefficient of Concordance W ranged from .76 to .82. A measure of perfect inter-rater agreement, a coefficient computed according to a formula by Horst (1949) which measures equality in level, distance, and relation, also revealed a substantial level of agreement.[1] Likely due to mean differences among respective pairs of raters, two coefficients (contextualistic and relativistic thinking) dropped to .51 and .61 respectively when using the Horst formula.

Table 13: Summary of Inter-Rater Reliabilities

Pair of Raters	Wisdom-Related Scale	Cronbach α	Pearson	Horst	Kendall W
1/2	Good Advice	.72	.72	.71	.78
3/4	Rich Knowledge	.77	.77	.75	.77
5/6	Good Life Review	.82	.82	.82	.82
7/8	Contextualistic Thinking	.76	.76	.61	.78
9/10	Relativistic Thinking	.69	.70	.51	.76
11/12	Awareness of Uncertainty	.71	.71	.70	.76

Since the various tests of inter-rater agreement indicated an acceptable level of reliability, average scores were calculated for each protocol for the six wisdom-related criteria. In addition to the overall level of inter-rater agreement, the reliability of ratings by subject and target-review age were investigated. The resulting correlation coefficients are based on fewer subjects and, therefore, are expected to be less stable. Of the total of 36 possible inter-rater coefficients, computed separately for each subject-age group, as well as target-review age, 31 were above .60. The remaining five were between .46 and .50. This finding does not suggest any major systematic differences in rater reliability as a function of subject age and target-review age.

Quality of Response and Chronological Age

Frequencies of Top Scores on the Six Wisdom-Related Scales

Since wisdom was confined to the top performances on the six wisdom-related scales, first the number of wise responses in the present sample was determined. To this end, the number of top scores, that is ratings greater than or equal to 5.5 was computed for each subject. At maximum a subject could have 6 and at minimum 0 ratings above or equal to 5.5. Figure 6 (see below) depicts the frequencies for the total sample and separately for each age group.

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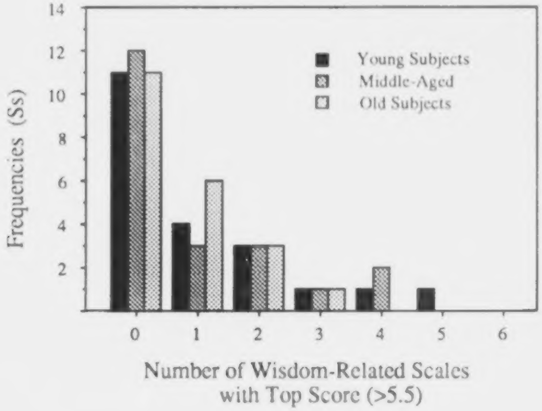
[1] I gratefully acknowledge the provision of a statistical program computing rater agreement coefficients by Dr. Urs Schallberger (Technical University Zurich).

Figure 6: "Wise" Protocols: Frequencies of Number of Wisdom-Related Scales with Top Score (> 5.5) Across Subject-Age Groups



As expected by the theoretical conception of wisdom as expertise, top-level performances were quite rare in the present sample. Only 1.5% (N = 1) of the sample had been rated above 5.5 on five of the six wisdom-related scales. 4.8% (N = 3) had been rated above or equal to 5.5 on three (one subject of each age group) and four (two middle-aged, one young subject) of the wisdom-related scales, respectively. In total, three of these seven "top" subjects were young, three were middle-aged, and one was an old subject.

When considering the average wisdom score (i.e., score averaged across the six wisdom-related scales), the highest score in the sample was 5.42 which was assigned to a young subject. In total, eight average wisdom scores were above or equal the score five: three were held by young, three by middle-aged, and two were held by old subjects.

Univariate Analyses: The Six Wisdom-Related Scales as Independent Variables

In order to analyze the whole range of response quality, the entire data matrix was—in a first step—subjected to a 3 (subject age: young, middle-aged, old) × 3 (target-review age: young, middle-aged, old) × 6 (scale: good advice, rich knowledge, good life review, contextualistic thinking, relativistic thinking, awareness of uncertainty) analysis of variance. The univariate analysis program of the software package for the social sciences (SPSSX ANOVA) was used for the univariate analysis. The purpose of this analysis was to obtain a first estimate of salient relationships. For this analysis, the six wisdom-related dimensions were assumed to be independent of each other (i.e., originating from different subjects).

Table 14: Summary of 3 × 3 × 6 Analysis of Variance

Source of Variation	Mean Squares	F	df	p
Main Effects				
Subject Age	.99	.45	2/324	.64
Target Review Age	1.34	.61	2/324	.55
Scale	5.15	2.33	5/324	.04
Two-Way Interactions				
Subject Age × Target Review Age	3.86	1.75	4/324	.14
Subject Age × Scale	4.20	1.91	10/324	.04
Target Review Age × Scale	2.14	.97	10/234	.47
Three-Way Interactions				
Subject Age × Target Review Age × Scale	2.02	.92	20/324	.57

This analysis was conducted for three reasons. First, for theoretical reasons an analysis format was sought which maintained the six criteria of expertise as conceptually separate representations of the knowledge domain "fundamental pragmatics of life." Second, it is argued that the data collection process did indeed yield rather independent observations as each dimension was rated separately by a different pair of raters. As a consequence, one can assume that the error variances of the scales are to a large extent independent of each other, which is one of the requirements for independent variables entered into an analysis of variance.[2] Third, taking into consideration the relatively small number of subjects per cell ($N = 7$), it was decided to start with a conservative analysis rather free of assumptions about the data (minimizing the alpha error). The considerations presented in Footnote 2 show that the 3 × 3 × 6 analysis of variance is a conservative procedure for the present data set. The analysis, however, may not capture some of the more fine-grained differences existing in the data.

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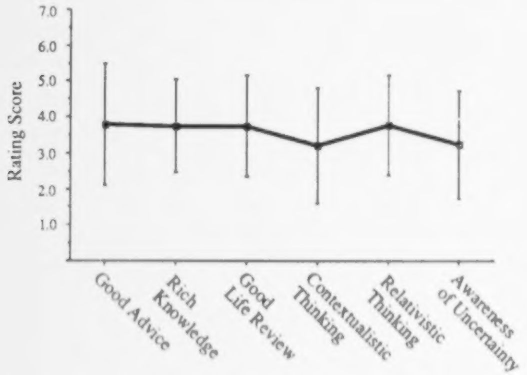
[2] The argument concerning the inter-relatedness of the scales is, however, not fully refuted. The independence only refers to the process of rating. Dependency still exists because the six wisdom-related dimensions are all applied to *one* protocol and not to six different protocols. In order to see what kind of error might be committed when using this form of analysis, t-tests for independent versus dependent samples were simulated and the results compared. The question asked was what would happen if a t-test for independent samples were to be applied to actually dependent samples. Investigation of the respective formulas shows that two counteracting processes are to be observed. On the one hand, there is an increase in degrees of freedom because of the "artificial" increase in subject number which leads (via a decrease of the critical t-value) to an increase in the alpha error. On the other hand, the denominator of the t-ratio (i.e., the error variance) is overestimated when ignoring the covariances. This, in turn, leads to a decrease of the t-ratio and thus to a decrease in the alpha error. As mathematical derivations show, the latter process, that is the decrease in the alpha error, becomes prominent whenever the average correlations among the allegedly independent variables exceed $\underline{r} > .21$. On the average, this threshold is surpassed by the intercorrelations among the six wisdom-related scales.

Results of the 3 × 3 × 6 ANOVA[3] indicated a significant main effect for scale ($F(5, 324) = 2.33$, $p < .05$)[4] and a significant two-way interaction of subject age by scale ($F(10, 324) = 1.91$, $p < .05$). The interaction between subject age and target-review age did not reach significance ($F(4, 324) = 1.75$, $p = .13$). Table 14 (see above) presents a summary of results.

Follow-up Analyses

A linear contrast revealed ($F(1, 372) = 11.34$, $p < .01$) that contextualistic thinking and awareness of uncertainty were together assigned lower scores ($M = 3.22$) compared to the remaining scales ($M = 3.77$). Figure 7 (see below) depicts this result.

Figure 7: 3 (Subject Age) × 3 (Target Review Age) × 6 (Wisdom-Related Scale) ANOVA: Significant Main Effect of Scale (Means, SD)



Note. "Contextualistic thinking" and "awareness of uncertainty" received lower scores that the other four scales.

To determine the source of the significant two-way interaction, one-way analyses with subject age as independent variable were conducted separately for the scales "good advice," "contextualistic thinking," "relativistic thinking," and "awareness of uncertainty." As indicated in Figure 8 (see below), the effect of subject age was only significant for the scale "awareness of uncertainty" (F(2, 60) = 4.43, $p < .05$). The young subjects were rated significantly lower than both the middle-aged and the old subjects which did not differ from each other (Student-Newman-Keuls $p < .05$).

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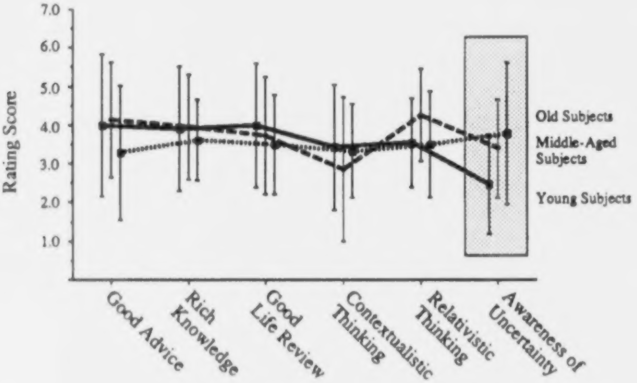
[3] The Bartlett-Box F test on the within-cell variances yielded a $F(52, 17178) = 1.1$ ($p = .29$) indicating homogeneity among variances.

[4] Within the text, standard p values (e.g., .001, .01, .05) are used. Please consult tables for exact p values (rounded up to two decimal places).

Figure 8: 3 (Subject Age) × 3 (Target Review Age) × 6 (Wisdom-Related Scale) ANOVA: Significant Interaction of Subject Age and Scale (Means, SD)



Note. The shaded area marks the significant difference between young subjects and middle-aged and old subjects (combined) on the scale "awareness of uncertainty."

Summary

The results of the initial, rather conservative (see Footnote 2, p. 126) 3 × 3 × 6 ANOVA indicated two statistically significant findings. First, averaged across all conditions, raters assigned lower scores to the wisdom-related dimensions "contextualistic thinking" and "awareness of uncertainty" than to the four other scales (combined). Secondly, a two-way interaction between subject age and scale was found, due primarily to the young adult subjects scoring significantly lower than both the middle-aged and the old subjects on the scale "awareness of uncertainty."

Multivariate Analyses: The Six Wisdom-Related Scales as Dependent Variables

The theoretical interest in gaining information separately for each wisdom-related scale was satisfied by the univariate analysis. For the present data set, however, this is a rather conservative approach and, therefore, as a second step of analysis, a multivariate approach was adopted. The rationale underlying this strategy is to use as much of the information contained in the data set as possible. In this vein, a multivariate analysis of variance does not keep the six wisdom-related scales separate but considers the correlations among the six scales. The multivariate analysis of variance forms linear combinations of the six wisdom-related scales that best differentiate between groups (e.g., Bortz, 1979).

Thus, a 3 × 3 between-subjects multivariate analysis of variance was performed on the six dependent variables (DV): good advice (AD), rich knowledge (KN), good life review (LR), contextualistic thinking (CON), relativistic thinking (REL), awareness of uncertainty (UN). Independent variables were subject age (young, middle-aged, old) and target-review age (young, middle-aged, old). The idea was to use the two analyses in a supplementary fashion.[5]

The multivariate analysis program of the software package for the social sciences (SPSSX MANOVA) was used for the multivariate analyses. Order of entry of independent variables was subject age, followed by target-review age. A test for the homogeneity of the variance-covariance matrices produced $F(168, 3144) = 1.19$, $p < .05$ for Box's M.

With the use of the very robust Pillai's Trace Criterion (Olson, 1974, 1976), the combined DVs were significantly affected by the factor subject age ($F(12, 100) = 1.95$, $p < .05$) and by the interaction between subject age and target-review age ($F(24, 208) = 1.59$, $p < .05$). There was no significant effect for the factor target-review age ($F(12, 100) = 1.39$, $p = .18$). Table 15 (see below) summarizes results of the multivariate analysis of variance.

The results reflected a quite strong association between the interaction of subject age and target-review age and the combined DVs ($1 - \text{Wilk's } \lambda = \eta^2 = .51$), 51% of the variance of the linear combination of the DVs was accounted for. The association between subject age and the combined DVs was moderate ($\eta^2 = .35$), 35% of the variance of the linear combination of the dependent variables was accounted for by the subject's membership of subject-age group alone, irrespective of target-review age assignment.

When comparing the MANOVA results with those of the 3 × 3 × 6 ANOVA, the effect of considering the six wisdom-related scales as dependent versus independent variables becomes obvious. The interaction effect subject age by target-review age had a probability $p = .14$ in the ANOVA. Whereas in the MANOVA, which searched for the best linear combination between the dependent variables the interaction effect became significant with $p < .05$.

The MANOVA results indicated first that a pattern of means could be constructed where performances differed by subject age. Secondly, these age differences across the six dimensions disordinally interacted with target-review age, that is the differences between subject-age groups depended on the target-review age. These significant

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[5] An alternative second analysis would have been a mixed-model repeated measures analysis of variance with the six dimensions as the within-subjects factor with six levels. This analysis would assume, however, that all dimensions have equal variances and, furthermore, that the correlations between pairs of repeated measurements are equal (e.g., Hertzog & Rovine, 1985; O'Brien & Kaiser, 1985). Apart from the fact that these assumptions were not met (i.e., significance of the test of sphericity, level of epsilon etc.), it did not seem theoretically reasonable to use this approach. The assumptions would imply for the theoretical conception that all dimensions ask for qualitatively the same rating process. In the context of the present multivariate analyses, it is assumed that the six dimensions are a positive manifold of the construct "wisdom" and that they can be treated as simultaneously dependent variables. This does not imply, however, that the rating processes associated with each of the dimensions are necessarily equivalent.

Table 15: Summary of 3 × 3 Multivariate Analysis of Variance and Contrasts

Source of Variation	F^a	df	p
Subject Age	1.95	12/100	.04
Contrast 1	2.56	6/49	.03
Contrast 2	1.36	6/49	.25
Target Review Age	1.39	12/100	.18
Subject Age × Target Review Age	1.59	24/208	.05
Contrast 3	1.01	6/49	.43
Contrast 4	.86	6/49	.53
Contrast 5	3.34	6/49	.01
Contrast 6	1.47	6/49	.21

[a] Pillai's Trace Criterion.

effects, however, do not allow us to make inferences about the dimensional and group-specific location of the differences. To this end, follow-up analyses were conducted.

Follow-up Analysis: Main Effect for Subject Age

Follow-up analyses concerning the significant effects of the overall MANOVA first focused on the main effect for subject age and were conducted in two steps. First, a set of contrasts was carried out on the independent variable subject age, and secondly, a discriminant analysis was performed on the six dependent variables for the significant contrast (Pedhazur, 1982).

A set of orthogonal contrasts was performed in order to further determine the source of the significant effect for subject age. The first contrast compared the combined scores of the young and middle-aged subjects with those of the older subjects and the second contrast compared the young with the middle-aged subjects (see Table 15 for summary of results). Only the first contrast was significant ($F(6, 49) = 2.56$, $p < .05$). Taking the Bonferroni correction of the alpha level into consideration ($.05 : 2 = .025$), however, the result can only be interpreted as a trend.

A discriminant analysis on the dependent variables for this contrast indicated that within the context of the six dependent variables, the scores of the scales "good advice" and "awareness of uncertainty" contributed most to the discrimination between the older subjects and the combined young and middle-aged subject groups.[6] Structural coefficients in excess of .3 are usually considered eligible for interpretation (e.g.,

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[6] The result of the discriminant analysis for the significant contrast is in line with the discriminant analysis for the omnibus effect.

Pedhazur, 1982; Tabachnik & Fidell, 1983).[7] The discriminatory power of the six dependent variables in terms of the significant contrast, was determined by computing Wilk's λ (.76). One discriminant function was found to significantly differentiate between the three subject-age groups ($F(6, 49) = 2.56$, $p < .05$). Table 16 (see below) lists the univariate F tests, standard discriminant function coefficients and correlations between the dependent and the canonical variables.

Table 16: Univariate F Tests, Standard Discriminant Function Coefficients (SDFC), and Structural Coefficients (Corr) for Significant Contrast of Main Effect for Subject Age

Source of Variation	Wisdom-Related Scale	MS between Groups	F^a	p	SDFC	Corr
Contrast 1	**Good Advice**	8.64	3.19	.08	-.62	-.44
	Rich Knowledge	.57	.29	.59	.15	-.13
	Good Life Review	1.91	.86	.36	-.52	-.23
	Contextualistic Thinking	.51	.20	.66	.54	.11
	Relativistic Thinking	2.29	1.43	.24	-.38	-.29
	Awareness of Uncertainty	10.57	4.81	.03	.87	.53

^{a}df = 1,54

Young and middle-aged subjects taken together had higher scores on the scale "good advice" (M = 4.07) than did the old subjects (M = 3.29). For the scale "awareness of uncertainty," the opposite was true: There, the old subject-age group was rated higher (M = 3.8) than the two younger subject groups (M = 2.94). Figure 9 (see below) depicts this result. Although it did not reach significance in the interaction effect, there was one exception to the score pattern just described. The old subjects' responses in terms of the scale "good advice" (M = 4.57) reached the level of the other two groups for the old target-review age (M = 4.15).

Summing up the results of follow-up analyses concerning the main effect for subject age, the old subject group significantly differed from the two younger subject groups. Old subjects had higher scores on the scale "awareness of uncertainty," whereas younger subjects showed higher scores on the scale "good advice." Results of the

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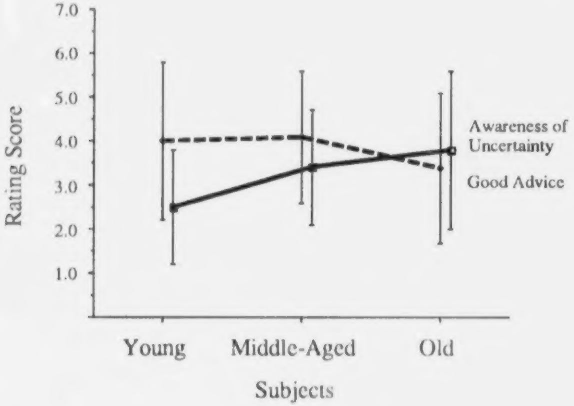
[7] Whenever variables are correlated, discriminant function coefficients should be interpreted with care (e.g., Cooley & Lohnes, 1971; Thorndike, 1978). Thus, the correlation coefficients in the last column were used for interpretation because it is less likely that they are strongly influenced by correlations among the DVs. The structural coefficients also help interpretation as Tatsuoka (1971, p. 280) noted, "The standardized coefficients are partial coefficients, thus if we wish to give *substantive* interpretations to the discriminant functions one should use the structural coefficients."

Figure 9: 3 (Subject Age) × 3 (Target Review Age) MANOVA: Significant Main Effect of Subject Age (Means, SD)



Note. Within the context of the six wisdom-related scales, "good advice" and "awareness of uncertainty" contributed most to the main effect.

univariate 3 × 3 × 6 ANOVA, reported above, are basically consistent with this finding. Statistically in the univariate analysis, however, only the scale "awareness of uncertainty" had yielded a positive advantage of the oldest age group.

Follow-up Analysis: Interaction Effect of Subject Age and Target-Review Age

To investigate which combination of levels of the two independent variables (subject age and target-review age) primarily accounted for the significant interaction, a set of four linear contrasts was performed. In the first contrast, young and middle-aged subjects were compared with old subjects on their respective responses to the middle-aged and old target problem. The second contrast compared the middle-aged with the young subjects on the middle-aged and old target problem. The third contrast, which was the only significant one ($\underline{F}(6, 49) = 3.34$, $\underline{p} < .01$), compared the young and middle-aged subjects with the old subjects on the young and old target-review age. Finally, the fourth contrast tested the responses of the middle-aged subjects against those of the young subjects concerning young and old target-review age. Table 15 (see above) summarizes the results of the contrasts.

The difference between young and middle-aged subjects versus old subjects on the young and the old target problem (i.e., third contrast) remains significant even when the Bonferroni correction is applied to adjust the alpha level of the single contrast (.05 : 4 = .013). The significant contrast helped to further determine the source of the significant two-way interaction. It seemed to be the difference between young and middle-aged subjects on the one hand and old subjects on the other hand that varied between young and old target-review age.

A discriminant analysis of the DVs for this contrast showed that it were the dimensions "good life review" and "contextualistic thinking" that best differentiated between the just mentioned four groups.[8] The discriminatory power of the six dependent variables for the groups involved in this contrast was determined by the computation of Wilk's λ (.71). One discriminant function was found to effectively distinguish between groups ($F(6, 49) = 3.34$, $p < .01$). Table 17 (see below) lists the univariate F tests, standardized discriminant function coefficients and correlation coefficients between the dependent and canonical variables.

Table 17: Univariate F Tests, Standard Discriminant Function Coefficients (SDFC), and Structural Coefficients (Corr) for Significant Contrast of Subject Age by Target Review Age Interaction

Source of Variation	Wisdom-Related Scale	MS between Groups	F^a	p	SDFC	Corr
Contrast 5	Good Advice	1.08	.39	.53	-.01	-.13
	Rich Knowledge	1.22	.61	.44	1.29	.17
	Good Life Review	8.95	4.06	.05	-.92	-.43
	Contextualistic Thinking	7.68	3.03	.09	-.53	-.37
	Relativistic Thinking	1.67	1.04	.31	-.71	-.22
	Awareness of Uncertainty	1.02	.46	.49	.27	.15

^{a}df = 1,54

For both scales, the interaction was disordinal; the older subjects were rated lower on the young target problem (LR: M = 2.79; CON: M = 2.86) than on the old target problem (LR: M = 3.71; CON: M = 3.43) and the young and middle-aged combined were rated lower on the old target problem (LR: M = 3.24; CON: M = 2.43) than on the young target-review age (LR: M = 4.3; CON: M = 3.71). The old subjects did better on the old target problem, and the younger subject-age groups did better on the review for a young target. Figure 10 (see below) illustrates the results of the follow-up analyses on the interaction effect between subject age and target-review age.

To summarize: Further investigations of the subject age by target-review age interaction demonstrated that the significance is primarily attributable to the differences among the young and middle-aged subjects (combined) and the old subjects concerning their responses to the young versus the old target problem. Old subjects were rated higher on "good life review" and "contextualistic thinking" for the old target-review age. Young and middle-aged subjects were rated higher for the young target-review age on both scales.

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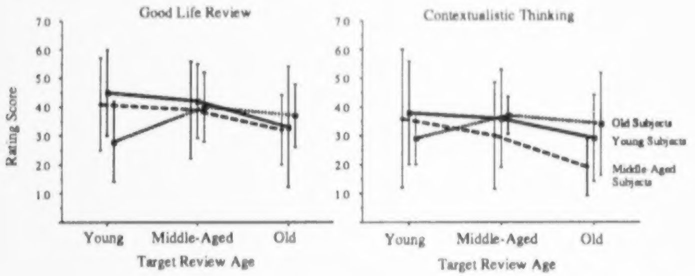
[8] The results of the discriminant analysis for the significant contrast are in line with the discriminant analysis for the omnibus effect.

Figure 10: 3 (Subject Age) × 3 (Target Review Age) MANOVA: Significant Interaction of Subject Age and Target Review Age (Means, SD)



Note. Within the context of the six wisdom-related scales, "good life review" and "contextualistic thinking" contributed most to the interaction effect.

Response Pattern and Chronological Age

Besides age differences in response quality in terms of score level of the respective scales, age differences in response patterns were analyzed. This analysis was done with regard to the theoretical distinction between the three more general (AD, KN, LR) and the three more specific wisdom-related dimensions (CON, REL, UN). An inspection of the means of each subject-age group showed that there was a larger difference between the two groups of scores (i. e., general versus specific) for the young age group than for the middle-aged and old subjects. The hypothesis concerning a difference in response patterns of young versus older subjects was tested. For this purpose, a one-way analysis of variance with subject-age group as independent variable and the difference score between the average of the three general and of the three specific scales as dependent variable was conducted.

The one-way analysis of variance was significant ($\underline{F}(2, 62) = 5.03$, $\underline{p} < .01$). The difference score, computed as the average of the general minus the average of the specific scales, significantly distinguished the three subject-age groups. Follow-up contrasts conducted under the Scheffé procedure showed that young and middle-aged subjects differed from old subjects ($\underline{p} < .05$). Young and middle-aged subjects did not differ from each other. More specifically, young and middle-aged subjects showed a greater difference between the two average scores ($\underline{M} = .83$) than did the old subjects ($\underline{M} = -.08$). The older subjects evinced a more homogeneous score pattern than did the younger subjects. This finding may indicate that it is worthwhile to investigate possible age differences in the structural relations among the six dimensions.[9]

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[9] Testing the three age-specific variance-covariance matrices for differences, however, showed no signifi-

Analyses of Control Variables

In addition to chronological age, quality of response to the Life Review Task may be influenced by a number of variables not associated with age or associated in a manner that is theory-inappropriate. Four such variables, that is total number of words spoken during response, verbal intelligence, years of education, and transitional character of life circumstances were assessed and are controlled for in the following analyses.

Possible Confound "Total Number of Words Spoken"

As the rating scores are based on protocols of varying length, the total number of words spoken may influence the judgement about the quality of the response (Langer & Schulz v. Thun, 1974). By scale definition, however, high scores on some of the wisdom-related scales (e.g., good advice, rich knowledge, good life review) may, in fact, be necessarily associated with longer responses. Rather than including the variable "total number of words spoken" in an analysis of covariance, the variation of total number of words as a function of subject age and target-review age was investigated.

On the average, subjects spoke 115 words per minute ($\underline{SD}$ = 27.24, range: 72–191). More specifically, they spoke 2,451 words in 21.5 minutes in the unprompted part and 2,707 words in 23.7 minutes in the prompted part. There were considerable individual differences.

The 3 (subject age) × 3 (target-review age) analysis of variance of total number of words spoken in the unprompted and the prompted part of the interview, however, indicated that no significant differences were due to subject age and target-review age. There were also no significant interactions between subject age and target-review age. Thus, any *age differences* in the ratings were not expected to be due to length of protocol.

Analysis of Covariance: Verbal Intelligence, Years of Education, and Transitional Character of Life Circumstances

The remaining three control variables were entered in a 3 (subject age) × 3 (target-review age) multivariate analysis of covariance. Prior to performing the covariance analysis, a check was made on the assumption of homogeneous regression coefficients. This preliminary test indicated that the assumption of equal regression slopes was tenable.[10] The combined covariates were not significantly related to the combined

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cant results. A test for the homogeneity of the variance-covariance matrices produced $\underline{F}(42, 10687) = 1.23$, $\underline{p} = .15$ for Box's M (60.48).

[10] The variance-covariance matrices of the nine cells included in the analysis were singular. Thus, a generalized inverse matrix was computed and entered into the analysis.

dependent variables (F(18, 144) = .91, p = .57). Furthermore, differences between subject-age groups proved to be robust throughout the covariance analysis.[11]

The analysis of covariance showed that the significant effects of the 3 × 3 MANOVA were not affected by subject differences in indicators that were judged to be possibly age-confounded but irrelevant to our theoretical conception. Differences in verbal intelligence, years of education, and the transitional character of life circumstances did not account for score differences between subject-age groups.

Analyses of Performance Factors Related to the Life Review Task

A number of performance factors involved when solving the Life Review Task (LRT) were analyzed in terms of their relationship to quality of response. With the following analyses, the focus switches from age differences in response quality to general characteristics of the LRT. As the LRT had been especially developed for the present study and the whole research approach is still quite new, such general task characteristics are of interest. The performance factors that were assessed are the following: subject target age difference, primary knowledge source for response, relationship to intelligence measures, self-reported familiarity with life review and self-perceived difficulty of LRT.

Analyses of Rating Scores in Terms of Subject Target Age Difference

The factor "subject target age difference" (STAD) subdivides the sample into five groups (i.e., two units retrospective and prospective, one unit retrospective and prospective, zero age difference) which are partially confounded with subjects' chronological age. Only the life review for a target close to the subject's own age (zero age difference) was performed by all age groups. In order to gain further insight into the interaction between subject age and target-review age discussed above, the present data were re-examined according to the difference between subject and target age. Furthermore, the following analyses may shed some light on the performance characteristics related to various age differences between subject and target-review age. Table 18 (see below) illustrates the factor "subject target age difference" within the design.

Some questions of interests are, for example, whether subjects, in fact, showed more knowledge and skills when they constructed a life review for a target person close to their own age (concurrent life review) than when the target is further away in age; whether it was more difficult (i.e., rated lower) to construct a life review for a target older than oneself (prospective) rather than for a target younger than oneself (retrospective); whether the amount of age difference (one versus two units) or the temporal direction (retrospective versus prospective) of the age difference between subject and target age was of greater importance or whether temporal distance and temporal direction were of equal importance for the quality of the response. To approach such questions, a multivariate analysis of variance on the six wisdom-related dimensions as dependent variables with "subject target age difference" as independent factor was performed. This analysis is conducted on the same set of data, therefore, results are only meant to supplement the interpretation of the analyses, mentioned above.

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[11] Partial correlations between age and the six wisdom-related scales, controlling for years of education, verbal intelligence, and transitional character of life circumstances, support these results of the analysis of covariance.

Table 18: Subject Target Age Difference within the Design

	Target Review Age		
Subject Age	Young Age	Middle Age	Old Age
Young Age	zero age difference	*one unit prospective age difference*	*two units prospective age difference*
Middle Age	*one unit retrospective age difference*	zero age difference	*one unit prospective age difference*
Old Age	*two units retrospective age difference*	*one unit retrospective age difference*	zero age difference

Main Effect: Subject Target Age Difference

By means of the Pillai's Trace Criterion the factor "subject target age difference" (STAD) showed a highly significant effect ($F(24, 224) = 1.97$, $p < .01$) on the combined dependent variables (see Table 19 below). The result reflects quite a strong association between STAD and the combined six dependent variables ($\eta^2 = .57$). That is, 57% of the variance of the combined dependent variables is accounted for by the age difference between subject and target-review age.

Table 19: Summary of Analysis of Variance (Subject Target Age Difference) with Contrasts

Source of Variation	F[a]	df	p
Subject Target Age Difference	1.97	24/224	.006
Contrast 1	4.02	6/53	.002
Contrast 2	.78	6/53	.59
Contrast 3	3.43	6/53	.006
Contrast 4	.71	6/53	.64

[a] Pillai's Trace Criterion.

To investigate further which of the levels or combination of levels of the factor STAD contributed most to the significant effect, a set of orthogonal contrasts was performed. The first contrast compared the life reviews covering two units age difference (retrospective and prospective) between subject and target-review age against those covering one unit age difference (retrospective and prospective) and zero age difference between subject and target-review age. This contrast was significant by the Pillai's Trace Criterion ($F(6, 53) = 4.02$, $p < .005$). The second contrast compared the life reviews with zero age difference between subject and target-review age against those with one unit age difference between subject and target-review age, again irrespective of temporal direction (i.e., retrospective or prospective). This contrast was not significant. The third contrast compared the retrospective and the prospective life reviews with one unit age difference between subject and target-review age against each other. The contrast was significant by the Pillai's Trace Criterion ($F(6, 53) = 3.43$, $p < .01$). The final fourth contrast, comparing the retrospective and the prospective life reviews with two units age difference between subject and target-review age against each other, was not significant. Even when taking the Bonferroni correction of the alpha level into consideration, the just mentioned significant contrasts are still valid (.05 : 4 = .012). Table 19 (see above) summarizes the results of these analyses.

Together with each contrast, a discriminant analysis was performed to gain further insight in the effect of STAD on the six dependent variables. Table 20 (see below) presents a summary of univariate F tests, standard discriminant function coefficients, and canonical correlations for both significant contrasts.

For the first contrast, the discriminant function—according to the correlations between the dependent and the canonical variable—indicated that the scales "good life review" and "relativistic thinking" contributed most. For both scales, life reviews with two units age difference between subject and target-review age gained lower scores ($M_{LR} = 3.04$; $M_{REL} = 3.15$) compared to the combined scores for life reviews with one unit age difference and the concurrent life reviews ($M_{LR} = 3.93$; $M_{REL} = 3.98$).

According to the correlations between the dependent and the canonical variables associated with the third contrast, two scales were the most important contributors to the discriminant function: "good advice" and "contextualistic thinking." The life reviews covering one unit retrospective age difference showed lower scores on "good advice" ($M_{AD} = 3.07$) and higher scores on "contextualistic thinking" ($M_{CON} = 3.68$) than the life reviews with one unit prospective age difference ($M_{AD} = 4.54$; $M_{CON} = 2.75$).

The results concerning the scales "contextualistic thinking" and "good life review" are in accordance with the findings in the context of the significant interaction effect of subject-age group by target-review age. There, young and middle-aged subjects were rated higher on both scales (LR, CON) for the young target than for the old target. For the old subjects the opposite was true. Thus, with regard to scores on the scales "good life review" and "contextualistic thinking" subject-age groups did better on the target-review age closer to their own age. The result concerning the scale "good advice" points back to the follow-up investigations of the main effect for subject age. Young and middle-aged subjects were rated higher, there, on "good advice" than were the old subjects.

Table 20: Univariate F Tests, Standard Discriminant Function Coefficients (SDFC), and Structural Coefficients (Corr) for Significant Contrast of Main Effect for Subject Target Age Difference

Source of Variation	Wisdom-Related Scale	MS between Groups	F^a	p	SDFC	Corr
Contrast 1	Good Advice	8.88	3.4	.07	.37	.36
	Rich Knowledge	.55	.3	.59	-1.22	-.11
	Good Life Review	9.08	4.22	.05	.92	.4
	Contextualistic Thinking	1.77	.69	.41	.12	.16
	Relativistic Thinking	7.08	4.49	.04	.78	.41
	Awareness of Uncertainty	.71	.28	.6	-.29	-.1
Contrast 3	**Good Advice**	15.01	5.75	.02	-.91	-.51
	Rich Knowledge	2.01	1.08	.30	-.71	-.22
	Good Life Review	.72	.34	.56	.33	.12
	Contextualistic Thinking	6.04	2.36	.13	.84	.32
	Relativistic Thinking	.01	.01	.94	.54	.02
	Awareness of Uncertainty	1.75	.7	.41	.37	.18

[a] df = 1,58

Briefly summarizing the analyses with the factor "subject target age difference": The results supported the previous findings of the analyses with subject and target-review age as classification factors in terms of the most important discriminating dependent variables. From a different perspective the significant contrasts helped to shed some more light on the interaction effect between subject and target-review age. Results indicated that life reviews covering two units age difference (retrospective and prospective) differed from all other types of life review. Life reviews with two units age difference were only performed by young and old subjects. They received lower scores on the discriminatory scales "good life review" and "relativistic thinking." Support is offered for the proposal that it is more difficult to review a character's life at the extreme age difference between subject and target-review age than to review a character's life closer to one's own age. Concurrent life reviews and reviews with one unit age difference, however, did not significantly differ from each other.

The discriminatory power of "relativistic thinking" was a new aspect in the pattern of results. This might be attributable to the fact that on this scale the middle-aged subjects differed from the two other subject-age groups. This difference has been of less theoretical interest within this study, thus the difference was not picked up by the contrasts performed in the analyses by subject and target-review age.

Finally, the retrospective and prospective life review with one unit age difference differed from each other on the scales "good advice" and "contextualistic thinking." The retrospective reviews scored higher on "contextualistic thinking" and the prospective reviews on "good advice."

Subject Age Within the Factor "Subject Target Age Difference"

Within three of the five levels of STAD, an age comparison could be conducted (i.e., between the three cells of life reviews with zero age difference between subject and target-review age and between the two cells of retrospective and prospective life review, respectively, covering one unit of age difference, see Table 18 above).

One-way (subject age) multivariate analyses of variance and respective discriminant analyses were performed on the six wisdom-related dimensions for each of the three levels. Concurrent life reviews (zero age difference) differed significantly by subject age ($F(12, 28) = 2.11$, $p = .05$). To further analyze this effect, the first contrast compared the young with the older subjects and the second contrast compared the middle-aged subjects with the older ones. Only the first contrast was significant ($F(6, 13) = 4.79$, $p < .01$).

The discriminant analysis for this contrast showed that within the context of the six dependent variables the dimension "awareness of uncertainty" differentiated best between the two groups. The concurrent life reviews of the young subjects were scored lower ($M = 1.79$) on the scale "awareness of uncertainty" than the concurrent life reviews of the older subjects ($M = 4.43$). The three subject-age groups also formed a linear trend ($F(1, 18) = 17.55$, $p < .006$): the middle-aged subjects' performance fell between that of the young and old subjects.

The effect held also true after the Bonferroni correction of the alpha level (.05 : 2 = .025). This result points back to the main age effect for the scale "awareness of uncertainty." Thus, the overall subject-age difference held true even for the supposedly "easiest" kind of simulated life review with no difference between subject and target-review age.

The one-way multivariate analysis concerning the effect of subject age within factor levels of STAD furthermore showed that life reviews with one unit age difference (retrospective and prospective) did not differ significantly. Middle-aged and old subjects did not differ in their responses to a younger target and middle-aged and young subjects did not differ in their responses to an older target.

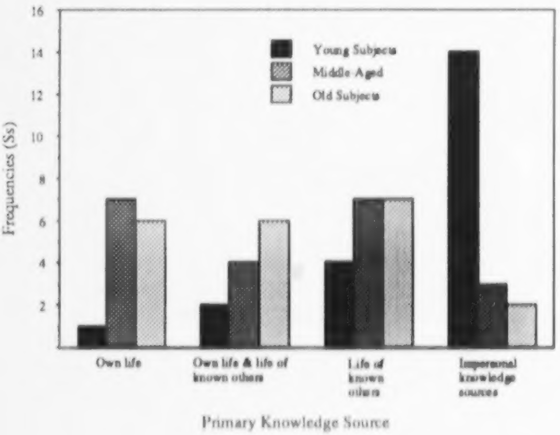
In sum, the test for age differences within the levels of STAD indicated significant results for the concurrent life reviews only. The three age groups were best discriminated by the scale "awareness of uncertainty," with the young subjects scoring lower than the middle-aged and old subjects.

Analyses of the Variable "Primary Knowledge Source"

To further investigate the knowledge base, subjects might have used in solving the Life Review Task, a number of analyses with the rank-ordered categorical variable "primary knowledge source" were conducted. First, Kruskal-Wallis one-way analyses of variance with subject-age group and with subject target age difference as independent factors were conducted.

Both analyses showed significant differences between the three subject-age groups and the five levels of STAD, respectively. The analysis with subject-age group as an independent variable demonstrated that young subjects significantly more often (mean rank = 45.1; N = 14) than both the middle-aged (mean rank = 25.95; N = 3) and old subjects (mean rank = 24.98; N = 2) used impersonal sources and lives of known others as primary knowledge source. Figure 11 (see below) depicts this result.

Figure 11: Primary Knowledge Source Employed to Respond to the Live Review Task Across Subject-Age Groups



Results of the analysis on subject target age difference as a categorizing variable indicated that for constructing prospective life reviews (mean rank = 41.88; N = 12) more often than for both retrospective (mean rank = 27.12; N = 2) and concurrent life reviews (mean rank = 27.0; N = 5) impersonal sources and life of known others was used as primary knowledge source. The distributions of concurrent and retrospective life reviews did not differ significantly ($\chi^2 = .02$, $p = .88$), although the life of others is used more often for the construction of retrospective (N = 10) than for concurrent reviews (N = 4) as primary knowledge source.

In addition, it was checked whether subject-age groups differed in the primary knowledge source employed for the construction of concurrent life reviews, which is the only kind of life review (level of STAD) that allows us to compare the three age groups with each other. Results of this analysis demonstrated the trend ($\chi^2 = 5.7$, $p < .06$) that young subjects (also for the construction of concurrent life reviews) more often used rather impersonal knowledge sources (mean rank = 15.57). The middle-aged and old subjects preferred their own lives and the lives of known others (mean rank = 8.71).[12]

Next, the relationship between the variable "primary knowledge source" and the dependent variables was determined by computing Spearman correlation coefficients. When examining the correlations between primary knowledge source employed for the response and each of the six dependent variables, the scale "awareness of uncertainty" evinced a significant negative correlation ($\rho = -.25$, $p < .03$) and the dimensions "good life review" ($\rho = .28$, $p < .02$) and "contextualistic thinking" ($\rho = .25$, $p < .03$) were positively correlated with the variable "primary knowledge source." In other words, high quality responses in terms of awareness of uncertainty were related to the primary use of personal knowledge sources. The opposite was true for high ratings on the scales "good life review" and "contextualistic thinking" (i.e., significant relationship to the primary use of impersonal knowledge sources).[13]

In conclusion, analyses of the variable "primary knowledge source" demonstrated that younger subjects were more likely to employ impersonal knowledge sources than old subjects, for the construction of life reviews close to their own age also. In addition, it was shown that the construction of prospective life reviews relied more heavily on impersonal knowledge sources than responses to the concurrent or retrospective life review problems. In the same vein, prospective life reviews with two units age difference (only young subjects) were different from retrospective life reviews with two units age difference (only old subjects).

As a predictor of scale scores, the variable "primary knowledge source" was relevant for the dimensions "awareness of uncertainty," "good life review," and "contextualistic thinking." The use of impersonal knowledge sources was related to high scores on the latter two scales, and the use of more personal knowledge sources predicted high ratings on the scale "awareness of uncertainty."

Location of the Life Review Task in the Realm of Tasks Assessing Intellectual Functioning

A number of variables are of interest in locating the Life Review Task with regard to existing tasks assessing intellectual functioning. Following similar procedures reported in the literature (e.g., Cornelius & Caspi, 1987) analyses of the relationship between Life Review Task scores and fluid as well as verbal intelligence; and age differences concerning self-perceived difficulty of and familiarity with the task will be reported.

Fluid and Verbal Intelligence

First, the multiple correlation between the six wisdom-related scales and fluid intelligence scores (shortened version of the APM) was computed. The correlation was quite low ($R = .24$, $R^2 = .06$). The R for regression was not significantly different from zero ($F(6, 56) = .59$, $p = .74$). Also, the simple correlations between fluid intelligence scores and each of the dependent variables were not statistically significant.

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[12] Similar results were found, when the three analyses were computed by using regular χ^2-tests.

[13] A Kruskal-Wallis one-way analysis of variance on the scores of the scale "awareness of uncertainty" with primary knowledge source as independent variable also evinced significant differences ($\chi^2 = 9.76$, $p = .02$).

Because raw scores had been entered into these analyses, multiple regression coefficients and first order correlations were also inspected separately for each age group. It has to be considered that these analyses are based on a smaller number of subjects and thus are expected to be less reliable. None of the multiple regression coefficients were significant. However, as the beta value for awareness of uncertainty in the multiple regression for the old age group already suggested, the first order correlation between awareness of uncertainty and fluid intelligence was significant for the old age group ($r = .54$, $p < .01$). For the other two age groups none of the first order correlations was significant.

Multiple regression ($R = .35$, $R^2 = .129$) and simple correlations between the six wisdom-related scales and verbal intelligence scores showed stronger relations than the correlations with fluid intelligence scores. The multiple regression, however, was not significant, either ($F(6, 56) = 1.28$, $p = .28$). It has to be taken into consideration, however, that the sample was controlled for verbal ability and via subjects' level of education also for fluid intelligence. The range of performance present in the sample, therefore, was restricted. As a consequence, most likely, correlations were underestimated.

Inspection of the first order correlations showed significant relationships for the three general wisdom-related scales (good advice: $r = .26$, $p < .05$; rich knowledge: $r = .23$, $p < .05$; good life review: $r = .22$, $p < .05$). Inspection of the age-specific coefficients confirmed the overall results.

Self-Perceived Difficulty and Frequency of Life Review

All three rank-ordered categorical variables (self-perceived difficulty of task and of personal life review, rate of life review) were entered in Kruskal-Wallis one-way analysis of variance with subject age as independent variable. None of the three analyses was found to be significant.[14] Results demonstrate that the three age groups neither significantly differed in their perception of the difficulty of life review, nor did they engage in personal life review at different rates.

Summing up, analyses concerning the relationship between quality of response and measures of task difficulty and task familiarity indicated that life review is a process familiar to and of comparable difficulty for all three age groups. Furthermore, neither the correlational relationship with fluid intelligence nor with crystallized intelligence was substantial. Because the range of intellectual performance in the present sample was restricted, these results should be interpreted with care. Given these provisions, one may conclude, however, that the LRT indeed taps into a domain of knowledge and skill that is not indexed by extant measures of psychometric intelligence. This supports the argument put forward in Chapter 2 which stated that tests of intelligence may be youth- and school-centric.

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[14] Similar results were found when the three analyses were computed by using regular χ^2-tests.

Analyses With Other Predictors of Quality of Response

The following variables were used in an attempt to identify proxies of chronological age concerning the prediction of quality of response to the Life Review Task: personality characteristics (NEO scales: extraversion, openness, agreeableness, conscientiousness), and life experience (Life Experience Inventory: number of important life events, number of important life events reflected upon).

First, age-related differences on these tentative predictors were investigated. According to one-way analyses of variance, subject-age groups differed significantly on two of the four selected personality scales. Old subjects scored lower on the extraversion scale than younger and middle-aged subjects. The opposite was true for the scale agreeableness. The fact that the three age groups did not show significantly different scores on the life experience measures is particularly noteworthy.

Next, first order correlations of the six wisdom-related scales were computed as well as the average wisdom score[15] and the potential predictors. A total of 42 correlations resulted. Such a matrix would yield on the average two significant correlations at the .05 level.

Of the 42 correlations, moderate, positive correlations were found between contextualistic thinking and number of life experiences reflected upon ($r = .4$, $p < .01$), between awareness of uncertainty and number of life experiences ($r = .32$, $p < .01$), and between the average wisdom score and the life experience scores (NOEXP: $r = .3$, NOREFL: $r = .35$, $p < .01$). All other correlations were below $r = .3$ and not significant. Thus, it seems that the power of the four selected personality scales as well as of the life experience measures for predicting the scores of the six wisdom-related scales is rather low. Individual differences in wisdom-related scale scores seem to emerge from variables other than the presently selected ones.

For exploratory purposes, some further analyses were conducted with the personality scales and the life experience scores.[16] First, the five variables were factor analyzed to ensure independence between variables. Three factors (56% variance) were extracted and entered into a 3 (subject age) × 3 (target-review age) analysis of covariance to exclude the possibility that previously discussed effects would fall below the threshold of significance when adjusting for the three factors. The three factors were life experience, diversion seeking, and kindness/empathy. The analysis of covariance evinced a significant relationship between the combined wisdom-related scales and the combined covariates. The previous significant main effect for subject age as well as the interaction effect of subject age by target-review age were slightly strengthened when rating scores were adjusted for the three covariates. The factor "life experience" significantly predicted four of the wisdom-related scales (good advice, rich knowledge, good life review, contextualistic thinking). The factor "agreeableness" showed a significant relationship only with good advice.

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[15] The average wisdom score is gained by averaging scores across the six wisdom-related scales.

[16] Detailed information about these analyses can be obtained from the author upon request: Max Planck Institute for Human Development and Education, Lentzeallee 94, 1000 Berlin 33.

Finally, an attempt was made to find a combination of variables that would —within the possibilities of the given set of variables—best predict wisdom-related scale scores. It was found that subjects with a great amount of life experience and kindness/empathy were most likely to have high scores on the scale "contextualistic thinking" and a high average wisdom score. In addition, high scorers on average wisdom showed a lower degree of diversion-seeking than low scorers. The predictive "power" of personality characteristics and life experience scores for the average wisdom score is especially interesting because the MANOVA on this score (DV) and subject age and target-review age (independent variables) demonstrated no significant effects (interaction: $F(4, 54) = .61$, $p = .66$; subject age: $F(2, 54) = .16$, $p = .86$; target-review age: $F(2, 54) = .21$, $p = .81$).

Summary

Reliability of Rating Scores

Various tests of inter-rater agreement indicated a quite satisfactory level of reliability. Therefore the argument is supported that rating can be an adequate (reliable, valid) method for analyzing verbal protocols given that enough effort is invested in scale development and rater training.

Quality of Response and Chronological Age

When considering the central hypothesis of the present study concerning age differences in quality of response, as indexed by the six wisdom-related dimensions, there were three primary findings. The first related to the overall low frequency of expert or "wise" responses present in the sample. No protocol received top scores on all six wisdom-related scales. One young subject had top scores on five scales. When considering the average wisdom score, 8 out of 63 responses were rated above or equal to 5 (maximum score was 5.43). Age groups were about evenly represented in this group of top protocols, with the old age group at a slight disadvantage.

Taking into consideration the whole range of response quality, the second finding was that of a main effect of subject age for the scale "thinking that acknowledges the uncertainty in life," with the old and middle-aged subjects being rated higher than the young ones, and for the scale "good advice" with the old and middle-aged subjects scoring lower than the young subjects. On the old target problem, however, old subjects scored as high as the two other subject-age groups on the scale "good advice." The result of the MANOVA concerning the scale "awareness of uncertainty" is supported by the 3 × 3 × 6 ANOVA. The follow-up test for "good advice," however, did not reach significance in the ANOVA. Thus, it should be interpreted with care.

The third main finding involved an interaction effect between subject and target-review age. The scales "good life review" and "contextualistic thinking" contributed most to the discrimination. Young and middle-aged subjects were rated higher on the young target problem. Old subjects were rated higher on the old target-review age. This was true for within- as well as between-subject ages. The interaction between subject age and target-review age, implying that old subjects scored higher on the life reviews for an old target and younger subjects scored higher on their responses for the young target, did not quite reach significance in the 3 × 3 × 6 ANOVA. However, acknowledging this interaction as a trend it is further differentiated by the above mentioned results of the MANOVA.

The effects found in the analyses of rating scores by subject and target-review age proved to be robust throughout the analyses of control variables (total number of words spoken, years of education, verbal intelligence, transitional character of life circumstances).

When considering differences in response quality not in terms of differences in score level but with regard to the score pattern across the six wisdom-related scales, old subjects were found to have a more homogeneous score pattern. The difference between the averaged general wisdom-related scales and the averaged specific wisdom-related scales was smaller than for the young and middle-aged subjects.

Performance Factors Related to the Life Review Task

Subject Target Age Difference

The significant interaction between subject age and target-review age can also be organized such that the variable "subject target age difference" is highlighted. If this is done, some light is shed on what the three different life review problems (young, middle-aged, old target) may imply with regard to the performance of the three subject-age groups. Interpretation of results is limited, however, because the variable STAD is confounded with chronological age.

Life reviews with no difference between subject and target-review age (concurrent life review) did not differ from those with one unit age difference. A comparison between the concurrent life reviews of each age group demonstrated that even for this kind of life review, which refers to subjects' own age and for which each subject should have most knowledge and skills available, old subjects were scored higher than middle-aged and young subjects on the "awareness of uncertainty" scale.

Furthermore, it was demonstrated that the temporal distance between subject and target-review age seemed to be critical in terms of quality of response once the target of the life review surpassed the subject's adjacent "generation" (two units age difference). The life reviews covering two units age difference between subject and target-review age were rated lower on the two scales "good life review" and "relativistic thinking" than all other kinds of life review.[17]

Whereas the temporal direction (prospective vs. retrospective) of the subject target age difference seemed to be important, when comparing life reviews which only had to bridge the gap between the subject and her adjacent "generation" (one unit age difference). Young and middle-aged subjects were rated higher for the prospective life reviews on the scale "good advice." Middle-aged and old subjects' retrospective life reviews were rated higher on the scale "contextualistic thinking."[18]

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[17] On life reviews with two units age difference between subject and target-review age only young and old subjects could be compared.

Primary Knowledge Source Employed for Response

Analyses with this variable evinced significant differences in the primarily employed knowledge source between subject-age groups as well as between levels of subject target age differences. Young subjects were more likely to use rather impersonal knowledge sources than middle-aged and older subjects. Even for the construction of concurrent life reviews, young subjects tended to use more impersonal knowledge sources than middle-aged and older subjects. In general, prospective life reviews were more likely to be constructed by primarily drawing from impersonal knowledge sources.

With regard to the relationship between quality of response and primary knowledge source, the scale "awareness of uncertainty" evinced a negative correlation and the scales "good life review" and "contextualistic thinking" correlated positively with the variable primary knowledge source. The higher the score on the awareness of uncertainty scale, the more personal was the primary knowledge source employed. Exactly the opposite was true for the scales "good life review" and "contextualistic thinking."

Intelligence, Task Familiarity, Task Difficulty

LRT scores did not significantly correlate with scores of the fluid intelligence measure. Considering age-specific correlations there was a stronger relationship between fluid intelligence and wisdom-related scores for old subjects than for young and middle-aged subjects. Wisdom-related scores, especially the three general wisdom criteria, were somewhat more related to verbal intelligence scores. The interpretation of these results, however, is confined by the fact that the range of performance (on the verbal and fluid intelligence tasks) present in the sample was limited. In general, it seems that wisdom-related dimensions tap into a domain of knowledge and skill that is not already indexed by extant intelligence measures. Nevertheless, a certain performance level in fluid and verbal intelligence has to be present in order to be able to respond to the LRT.

Subject-age groups did not differ in how difficult they perceived the Life Review Task and personal life review to be, neither did they differ in how often they engaged in personal life review. Therefore, the ecological validity of the LRT, in terms of practice and self-perceived difficulty, seems to be satisfactory for all three age groups.

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[18] Neither the analysis of differences between young and middle-aged subjects on the prospective life reviews, nor the analysis of differences between middle-aged and old subjects on retrospective life reviews yielded significant results.

Proxies of Chronological Age as Predictor of Response Quality

The correlations between proxies (personality scales, life experience measure) and wisdom-related scales were rather low. Consequently, the attempt to find a combination of such variables that would be a good predictor of life review scores was not particularly successful. An analysis of covariance demonstrated that the effects of subject age and target-review age were robust against the adjustment of means for the proxies.

The importance of degree of life experience and of the personality characteristic "kindness/empathy" was demonstrated for scores on the scale "contextualistic thinking." In addition to these two predictors, participants with high average wisdom scores also seemed to be less diversion seeking than low scorers. The average wisdom score is particularly interesting since it could not be predicted by chronological age. This finding demonstrates that chronological age in itself is not the only predictor of knowledge and skill in the domain "fundamental pragmatics of life."

Chapter 7
Discussion and Conclusions

In this final chapter I shall first summarize the main hypotheses underlying the study. The findings are then considered in relation to these main questions. In addition, some further thoughts concerning such findings and some limitations of the present study will be presented. Finally, the discussion will focus on the societal framework outlined in Chapter 1, and suggest ways in which the results of the present study speak to a more balanced (rather than exclusively negative) perspective on the nature of aging in modern societies.

Summary of Hypotheses

The Life Review Task (LRT) was developed in order to tap into subjects' knowledge about how human beings move through life, about possible variations in the life course and their conditions, and about problems that might arise as well as possible solutions (i.e., knowledge about the fundamental pragmatics of life). The aims of the present study primarily involved an exploration of possible age differences, and mediators of such age differences, in responses to the Life Review Task.

A subordinate goal of the study was to examine some of the performance factors involved when responding to the LRT. Two reasons prompted this examination: First, to collect corollary information about the LRT which was developed just for the present study, and represents a new research approach to the study of intellectual functioning; second, to shed some light on putative cohort effects involved in this cross-sectional study.

The "strong" developmental hypothesis was that older subjects would show responses of higher or at least comparable quality (as indexed by the six wisdom-related scales) than younger subjects. This "strong" hypothesis was modified to take into account differences associated with target-review age and type of wisdom-related scale. The "weak" developmental hypothesis was that older subjects would be assigned higher scores on the old target problem and on the more specific wisdom-related scales (i.e., contextualism, relativism, awareness of uncertainty).

Exploratory questions were asked concerning possible proxies of chronological age as predictors of response quality. Specifically, the relationship between individual differences in quality of responses and the amount and quality of life experiences, and certain personality characteristics such as extraversion, agreeableness, conscientiousness, and openness to experience were investigated.

With regard to the performance factors involved when responding to the LRT, it was expected that the subject target age difference associated with a given life review problem would be related to response quality. The hypothesis was that response quality would decrease with increasing difference between subject and target-review age. Furthermore, it was expected that a positive subject target age difference (i.e., retrospective life reviews) rather than a negative one (i.e., prospective life reviews) would more likely be related to higher response quality.

Another performance factor explored with respect to possible cohort effects was the primary knowledge source employed for the response. The hypothesis was that younger subjects would primarily use impersonal knowledge sources and old subjects would prefer personal knowledge sources. Finally, it was expected that subject-age groups would not differ in the self-perceived difficulty and familiarity with the LRT (ecological validity), and that the LRT would tap into a domain of knowledge and skill not already indexed by extant measures of psychometric intelligence.

Answering the Questions of the Study

Age-Related Differences in Knowledge About the Fundamental Pragmatics of Life

The "strong" developmental hypothesis that older subjects would show an overall (all wisdom-related scales, all target ages) higher level of knowledge (declarative and procedural) of the domain, fundamental life pragmatics, was falsified. Yet, the reverse finding of a negative age difference which is typical of research on intellectual aging was not obtained either. Nor was the superiority of middle-aged adults, for example, as reported by Denney's research (1982) on practical problem solving, confirmed by this study. By and large, older adults performed as well as younger adults.

Both of the "weaker" developmental hypotheses concerning the relationship between subject age and scores on specific wisdom-related scales, and response quality related to specific target-review ages were met. For the criterion "awareness of uncertainty," one of the more elaborate and specific wisdom-related scales, old and middle-aged participants (combined) were rated higher than young subjects. The age advantage was even stronger for concurrent life reviews: Here, middle-aged subjects as well as younger subjects were rated lower than the old subjects. Thus, the older subjects showed more knowledge and skills referring to the recognition and management of the uncertainties in life than the two other age groups.

With regard to the relationship between target-review age and age-specific response quality, it was found that old adults scored higher on two scales ("good life review," "contextualistic thinking") for the old target problem, and younger subjects scored higher on both scales for the young target problem. In other words, concurrent life reviews of young and old subjects, respectively, were rated higher than life reviews with two units age difference between subject and target-review age. It may be concluded that, at least for two scales within the given set of wisdom-related criteria, the similarity between subject and target-review age seemed to enhance the quality of the response. Subjects seemed to know most about the life contexts and the inter-relationships of life contexts in the past, the present, and the future corresponding to their own age. Also, they were better able to perform a good life review (construction of a life course, its interpretation and evaluation) for a fictitious woman close to their own age.

Finally, besides mean-level score differences there were also age-related differences in score pattern. For the old subjects, the difference between the average "general" and the average "specific" wisdom score was significantly smaller than for the young subjects. Old subjects showed a more homogenous score structure than young subjects. First, this result seems to support the meaningfulness of the theoretical distinction between the more general and the more specific wisdom-related scales. Second, in older subjects' knowledge systems, the six wisdom-related dimensions seem to be more evenly developed (disregarding the score level) than in younger subjects' knowledge systems. This finding, as well as old subjects' superiority on the specific scale "awareness of uncertainty," may be tentatively interpreted by involving an analogy between the nature of life-span development and a particular model of skill acquisition (Anderson, 1982, 1987). Provided the analogy is valid, the acquisition of expertise in the domain "fundamental pragmatics of life" would proceed from the general to the more specific and higher-level procedural aspects of the knowledge system including its integration.

In sum, results of the present study demonstrated that old subjects showed higher levels of performance only in terms of their awareness of the uncertainties in life. Results, however, also indicated that old subjects' performance was not significantly lower concerning the other criteria (across target-review ages). It can be concluded that the primary result is age-related stability and that there is advancement in one aspect of the knowledge system "fundamental pragmatics of life." Thus, the results—weak as they may be judged by others—are consistent with the dual process model of intellectual development across the life span which predicts stability and/or growth for the pragmatics of intelligence (see Chapter 2). The knowledge domain "fundamental life pragmatics" (as accessed by the Life Review Task), seems to be an area of the pragmatics of intellectual functioning that evinces stability and even selective growth over the life span.

Ontogenetic Versus Historical Development

The intention of the study was to treat variation in chronological age as one index of life-span development. The study, however, is cross-sectional. Thus, the possibility of generational or cohort differences clouds the interpretation (e.g., Baltes, Reese, & Nesselroade, 1977).

Women in the older age group were born between 1911 and 1921 (World War I, political change from empire to republic etc.); middle-aged subjects were born between 1931 and 1941 (economic depression, World War II etc.); the younger subjects were born between 1951 and 1961 (post-war reconstruction, rising living standards, student movement in the 60s etc.). Generational or cohort differences exist, for example, in the relative rates at which women were trained for a career and maintained their place in the workforce. Combining a professional career with a family is rarer for those women born between 1911 and 1921 than for women born after 1940. This could imply, for example, that the issue of family versus career (central to the Life Review Task) is more familiar to recent generations than to earlier generations, and, therefore, in the present study is more familiar to the young than to the old women.

Furthermore, the availability of psychological and sociological knowledge about the life cycle and human behavior is more widespread nowadays than was the case 30 or 40 years ago. Consequently, the older women may not be as well acquainted with this information as the younger women. Or, at least, older women may be familiar only with that knowledge which specifically refers to old age (e.g., knowledge about physical decline with age), and less familiar with knowledge referring to young adult experiences (e.g., child care).

In any case, interpretations of age differences in quality of responses have to take into account both ontogenetic and historical explanations. To a certain extent, the different target-review ages involved in the design provide an opportunity to weigh these two influences (historical and ontogenetic) against each other.

As the older subjects were rated higher on the scale "awareness of uncertainty" across all target-review ages (i.e., also for a young target), the older subjects' higher performance on this specific wisdom-related scale seems to be rather immune to the historical advancement of knowledge about the human life course and human behavior. The finding, however, that subjects (young and old) did best on the scales "good life review" and "contextualistic thinking" when reviewing their own age group, suggests that knowledge about relevant life contexts and their inter-relatedness as well as knowledge of how best to review a life, is specific to one's own age group. It seems that "contextualistic thinking" and "good life review" are two aspects of the knowledge domain "fundamental life pragmatics," that are more susceptible to historical factors than the scale "awareness of uncertainty." The wisdom-related dimension "awareness of uncertainty" seems to be an aspect of the knowledge system "fundamental pragmatics of life" which, in fact, requires a longer life time and the experiences associated with it in order to be acquired. In early adulthood, one may think that the perceived uncertainty will vanish with increasing life experience. Older adults have had the opportunity to realize that uncertainty in life is not a matter of lacking life experience but is an inherent feature of life with which one has to learn to cope.

In terms of trying to weigh historical against ontogenetic development, it seems worthwhile to not only consider old subjects' superiority on the scale "awareness of uncertainty" (i.e., differences in score level) but also differences in score structure, that is, older subjects' more evenly developed knowledge system. The argument would be that historical advancement of knowledge about the fundamental pragmatics of life may predominantly become visible in score *levels* rather than in the score structure. Disregarding the score level, old subjects demonstrated little difference between the general and the specific wisdom-related scales. Young subjects, however, showed a larger difference between specific and general scales, with higher scores on the general wisdom-related scales. Therefore, in analogy to Anderson's model of skill acquisition, it may be concluded that older subjects are further advanced in their acquisition of knowledge about the fundamental pragmatics of life. In old subjects, general and specific aspects of the knowledge system seem to be quite evenly developed.

Further tentative support for such an ontogenetic interpretation comes from the pilot version of the task which seemed to be more difficult for younger subjects. The pilot version of the task provided less structure concerning the expected response. Considering the limited number of pilot subjects, however, the finding should be interpreted with care. Young subjects' difficulties with the pilot version might suggest that they may have a less integrated knowledge system and a lack of higher-level procedural knowledge, meaning that they were not able to further define the unstructured problem. Providing more structure in the final version of the task may have helped younger subjects to overcome their difficulties in dealing with the task. The cues provided may have assisted younger subjects in the process of defining the problem which old subjects seemed to be able to do by themselves.

Knowledge Source and Cohort Effects

Analyses of the primary knowledge source employed for constructing the life review of the fictitious person are used to shed more light on the above postulated cohort effects. Results showed that subject-age groups differed in their reported use of primary knowledge sources for solving the Life Review Task. Young subjects said they had tended to use rather impersonal knowledge sources, whereas the older subjects preferred to draw on personal knowledge as a primary source. As a trend, this tendency was even visible for the construction of concurrent life reviews. This suggests that older adults (according to self report) used more direct experiences with concrete life situations, their own and those of others, to construct the life review for the fictitious woman.

It seems that knowledge about the fundamental pragmatics of life can be gained through direct experience with life situations in one's own life or that of others, as well as through indirect experience with life situations through reading books, watching movies or leading conversations. In theories of cultural evolution (e.g., Leakey & Lewin, 1978), it is often claimed that without the development of possibilities for indirect experience (e.g., development of script), mankind would be culturally at a much lower level. This argument, however, should not be taken as if direct experience has thereby becomes superfluous.

In a similar vein, it is proposed here that knowledge gained through indirect experience (impersonal knowledge sources) is a very important part of the knowledge about life but that, nevertheless, there are aspects of knowledge about life (i.e., recognition and management of the uncertainties in life) that seem to require direct experience (personal knowledge source). This does not imply that both kinds of experience, direct and indirect, exist independently of each other, rather, it is assumed that they interact. It is, for example, possible to conceive of instances where one mode of knowledge is expanded, interpreted or relativized by the other. The proposal just presented refers to direct experience as a *necessary* condition for certain aspects of the knowledge system about life.

When translated into the terminology of direct and indirect experience, the cohort difference argument states a cohort-specific increase in socialization experiences involving the fundamental pragmatics of life dealing with information gathered from literary and multi-media sources (indirect experience). Direct experiences with a large number of different life situations, on the other hand, is a hallmark of living long. As you may remember, three of the six wisdom-related scales picked up the differences in the primary knowledge source employed for the construction of the life review: awareness of uncertainty, good life review, contextualistic thinking. It is suggested that the uncertainty scale seems to represent an aspect of the knowledge system, fundamental pragmatics of life, that primarily calls for direct experience in order to show expertise in that aspect of the knowledge system.[1] Contrary to this, it seems that expert responses with respect to the two other scales (good life review, contextualism) can also be produced when primarily using indirect experience.

Because it appears that indirect experience is enough to develop at least certain aspects of the expertise in fundamental life pragmatics, one may ask whether expertise based on indirect experience and expertise based on direct experience are of the same quality? Is there still need for the transmission of personal experiences nowadays? Some people answer this question with "no" and argue that even at young ages one is able to pick up the relevant knowledge without having to make the experiences oneself. Another conclusion, however, could be to claim that there, in fact, is a difference in the quality of expertise which does not show in responses to the Life Review Task. This difference may only become obvious in situations of actual behavior rather than situations assessing knowledge systems.

So far, we have discussed the increase of indirect experiences with the domain "fundamental pragmatics of life" available in our society as a historical process. A further issue in this context relates to the question whether the change from using primarily impersonal to personal knowledge sources, in fact, represents the ontogenetic path followed in the acquisition of expertise in fundamental life pragmatics. Or is this shift a historical process in terms of an overall increase of indirect experience chargeable to a decrease in direct experience? Rosenmayr (1987b) has presented the latter argument and maintained that historically, irrespective of chronological age, we seem to possess less and less knowledge based on personal experience (direct experience) and more and more knowledge based on mass media (indirect experience). If the latter interpretation were true, the young subjects of the present study would never come to use personal knowledge sources to a considerable degree. This question could only be decided by a longitudinal study with the now young subjects or another cross-sectional study at a later time when the now young participants will make up the old age group.

Proxies of Chronological Age as Predictor of Response Quality: A First Attempt

The present study made a first attempt to identify other predictors of response quality than chronological age, an attempt which was not very successful. Measures of life experiences and personality characteristics of a person were used as proxies of chronological age. The relationships between the proxies and the scale scores were only moderate. Nevertheless, the amount of important and reflected-upon life events, the degree of kindness and empathy as well as the degree of diversion-seeking (high extraversion, high openness, low conscientiousness) did differentiate between the high and low scorers on the average wisdom score (averaged across the six scales). The average wisdom score, at the same time, was not predictable by chronological age. Although this result should be interpreted with care, one might conclude that the chosen variables point in the right direction but certainly need further refinement.

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[1] This does not imply that awareness of uncertainty could not be taught if someone would be able to develop an adequate curriculum.

The Life Experience Inventory developed for the study needs to be refined (e.g., temporal distribution of life events, cognitive consequences). One should consider whether it is of use to develop a standardized instrument at all, given the highly idiosyncratic combinations and effects of life events (e.g., Filipp, 1981). A standardized instrument that considers all aspects of possible importance in terms of effects of life events would probably be very time-consuming in administration. It may be more economical to develop a string of relevant open questions, possibly combined with rating scales (e.g., what were the most important events in your life?, when do you think about life?). In a similar way, the personality measure should be reconsidered. Probably measures of personal control, of coping style (represser versus sensitizer), and a motivational measure should be tested.

Performance Factors Related to the Life Review Simulation Task

The second part of the discussion will deal with the interpretation of results concerning the possible performance factors involved when responding to the LRT. It is meant to provide a first impression with regard to the ecological validity of the LRT, concerning the aspects of intellectual functioning that are assessed by the LRT, and concerning some critical differences between life review problems.

Aspects of Ecological Validity of the Life Review Task

As expected, the Life Review Simulation Task proved to be ecologically valid. Subject-age groups did not differ in the self-perceived difficulty of and familiarity with the task of constructing a life review. Such age differences in task difficulty and familiarity had been found in studies on measures of fluid intelligence (Cornelius, 1984).

With regard to the lack of age differences in reported frequency of engaging in life review (familiarity), subjects' answers to the question concerning the function of life review (Life Review Questionnaire) were reviewed.[2] The three age groups placed different emphases on their descriptions of the function of life review. Young subjects stressed the aspect of finding their identity, middle-aged subjects primarily talked about stabilizing their identity. Finally, old subjects emphasized the evaluation of their identity and the drawing of general conclusions that could be passed on to others. These age-related differences in the function of life review support and further explain the argument presented in Chapter 3. It had been proposed there that in contrast to the general stereotype and also in contrast to some theories of life-span development, life review is not an activity confined to old age. Rather, life review is considered a process active throughout the whole life span, although function and style may vary.

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[2] In the following paragraphs, results of an exploratory content analysis of the Life Review Questionnaire (done by two independent coders) will be used to help the interpretation.

Again, a historical process has to be considered which might modify the interpretation of a lack in age differences in the frequency of engaging in life review. It has been claimed that rate and popularity of introspective processes vary across historical time. Self-reflection, discussing one's own life with others is assumed to be much more in vogue nowadays than it was 30 years ago (Ryff, 1984). Thus, if one were to accept this view, one could argue that young subjects' reported frequency of engaging in life review is similar to those of old participants because current times are more "self-reflective," rather than because life review is an activity in which individuals engage throughout their adult lives.

This explanation, however, does not tell the whole story. Most of the older subjects indicated in the Life Review Questionnaire that their rate of life review had been a function of critical life events rather than chronological age. They described a frequency function resembling a wave. In a similar way, as some life-span theories have associated the activity of life review with transitions in life, subjects' answers seem to support the contention that life review is a life-long process. It should be noted, however, that the discussion on whether the lack of change in rate of life review is a cohort effect or not does not touch on the conclusion that the Life Review Task for the present sample has proved to be ecologically valid (task familiarity and difficulty). It is only interesting in terms of putative triggers associated with the process of life review.

Which Aspects of Intellectual Functioning does the LRT Tap into?

Our efforts to identify the correlational validity of the LRT in the context of psychometric measures of intelligence were not fertile. The relationship turned out to be small (crystallized intelligence) or non-existent (fluid intelligence). Yet, this finding can also be taken to lend support to the contention that the Life Review Task, in fact, taps into additional aspects of intellectual functioning beyond those represented by extant measures of psychometric intelligence.

These findings, however, need to be considered in light of the fact that the present sample was biased towards individuals with average and above-average intellectual functioning. How results would look if a more heterogeneous sample were to be studied remains an open question. Would, for example, subjects with below average scores on fluid intelligence measures nevertheless do well in the LRT?

With regard to the pattern of relationships to tasks assessing fluid and crystallized intelligence, the Life Review Simulation Task seems to differ from other tasks recently developed in order to assess "practical" aspects of adult intellectual functioning (e. g., Cornelius & Caspi, 1987; Willis & Schaie, 1986). Willis and Schaie (1986), for example, reported much higher correlations with fluid intelligence (figural reasoning, inductive reasoning) as well as crystallized intelligence (social knowledge, vocabulary) measures.[3] In the study conducted by Cornelius and Caspi (1987), the correlations were comparable to the present study in terms of size but they differed insofar as both the relationship with fluid (Letter Series Test) and with crystallized intelligence (Verbal Meaning Test) were of a similar size.

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[3] Correlations in the Willis and Schaie study were based on old subjects only. In the present study (see p. 142), the correlation calculated separately for the old age group was also much higher than the one for the two other age groups, but did not reach the level of correlations present in the study by Willis and Schaie (1986).

In their study, Cornelius and Caspi (1987, p. 151) concluded that the low correlations between measures of crystallized and of practical intelligence would not support the dual process model of adult intellectual functioning as proposed by Baltes, Dittmann-Kohli, and Dixon (1984). In contrast, it is claimed here that results of the present study as well as of the study by Cornelius and Caspi in fact support the dual process model which would claim that both measures of crystallized intelligence and the Life Review Task or tasks assessing practical intelligence tap into different aspects of the pragmatics of intelligence and, therefore, would not be expected to be highly correlated.

Quality of Response as a Function of Subject Target Age Difference

As a function of subject and target-review age, five different kinds of life review problems can be distinguished, and were examined in terms of their effect on response quality. When interpreting these results it has to be considered, however, that except for the concurrent life review none of the five different kinds of life review were constructed by all three age groups.

Only when target age and subject age differed by two units of age difference (either prospective or retrospective) response quality was negatively affected. The specific effect obtained was that subjects were rated lower on the scales "good life review" and "contextualistic thinking" for life reviews that had to cover two units age difference between subject and target-review age. Life reviews with two units subject target age difference (STAD) seemed to exhaust subjects' scope of knowledge of the domain "fundamental pragmatics of life." At the "fringes" of the knowledge system (two units subject target age difference), it did not seem to matter whether the subject had to imagine the future (prospective) or whether she had to adapt to different historical settings (retrospective).

The remaining kinds of life review problems (prospective, retrospective with one unit STAD, concurrent) did not differ from each other in terms of response quality. Neither the expected inferiority of life reviews for a fictitious woman older than the subject (prospective) nor the expected superiority of life reviews targeted at subjects' own age (concurrent) was obtained. Analyses of the primary knowledge source employed for the response may shed some light on this lack of differences. It is suggested that young subjects made up for the difficulty of prospective life reviews by using primarily impersonal knowledge sources to solve that type of life review problem. In contrast, concurrent and retrospective life reviews were constructed by primarily drawing on personal knowledge sources. Furthermore, if one is willing to speculate, it is suggested that subjects may have too little emotional distance or too much emotional involvement with a fictitious person's life who is close to one's own age. Considering results of research on social cognition and perception (Bower, 1981; McGinnies & Sherman, 1952), this could imply that it is more difficult to gain access to such knowledge in the domain "fundamental pragmatics of life" that is related to emotionally troublesome aspects of one's own life. The difficulty in accessing this knowledge may be one reason for the similarity of ratings of concurrent, prospective, and retrospective life reviews although one should have most knowledge about the life of a fictitious person close to one's own age.

Limitations of the Study

Although the interpretations of results offered above have not been repeatedly qualified, it is necessary to acknowledge the limits of the present data and analyses. In this respect one may note, in particular, limitations with regard to the sampling of subjects, the Life Review Task, rating as method of data analysis, and analyzed data sets.

Subjects

The present study involved an exclusively female sample. A certain level of dissatisfaction is related to this lack of variation in gender. However, since the primary focus of the dissertation has been on possible age-related differences in knowledge systems about the fundamental pragmatics of life, the investigation of gender differences was left to further studies. Furthermore, a study employing life planning problems within the same research paradigm found no overall significant differences between men and women (Smith et al., in press).

Nevertheless, the comparison between women, who have mostly combined a professional career with children, and men in a similar position would be very tempting. Such a study is not likely to, through the sample selection, automatically "install" the usual gender difference of women emphasizing the family and men the profession. Therefore, such a comparison would allow for a better investigation of the idea that men and women, by virtue of their gender, experience life events differently (Huston-Stein & Higgins-Trenk, 1978).

Furthermore, in a study on biographical knowledge, Strube (1985) found an interesting gender difference. Both male and female subjects reconstructed a female biography in a relatively stereotypical and a male biography in a relatively ideographical way. It would be interesting to find out whether a similar pattern of results was found with the Life Review Task.

Another limitation in terms of subjects refers to an overall quite low level of response quality. In other words, only few wise responses as indexed by high ratings on all six wisdom-related scales were present in our sample. Therefore, results of the present study primarily address issues of knowledge about fundamental life pragmatics rather than dealing with expertise in that knowledge domain.

Although the attempts of the present study to identify critical variables which could function as predictors of expertise were not very successful, future research efforts should be invested in identifying criterion groups with expertise in fundamental pragmatics of life. One strategy would be, for example, to elaborate on theory and measurement instruments concerning predictive variables productive of expertise in fundamental life pragmatics and apply such measures as screening instruments for the selection of the final sample. However, such a procedure would be very costly and time-consuming.

Therefore, an alternative strategy may be worthwhile considering. A nomination procedure may be employed to identify such experts. This strategy works from the assumption that wisdom is a socially recognized phenomenon and that consensus can be reached on who is a wise person. An argument that could be raised against this strategy is that high social visibility may in some instances be related to characteristics quite opposed to our understanding of a person with expertise in fundamental life pragmatics. Such persons in the limelight may be, for example, power-hungry, narcissistic, and vain. Consequently, one has to be careful in the selection of nominators and in the formulation of nomination criteria.

The Life Review Simulation Task

A major limitation in reference to the Life Review Task is its focus on the topic family versus career. The focus on this topic may have been of disadvantage to the older women, as this alternative has become a more common issue in recent years and is an important problem for most young women nowadays. Similarly, in a life planning study subjects of all ages were asked to solve life planning problems for young and old fictitious persons. Findings of this study suggested that older subjects were at a disadvantage with so-called young problems, that is problems which are specific to younger ages (Smith et al., in press).

It is unclear, however, to what degree features specific to a given subdomain (e.g., related to family and career) would play an important role in accessing wisdom-related knowledge. For example, one may argue that the three more wisdom-specific criteria (contextualistic thinking, relativistic thinking, awareness of uncertainty) should be fairly robust against variations in amount of declarative knowledge and experience with a given subdomain of the fundamental pragmatics of life. These specific wisdom-related aspects of knowledge in the fundamental pragmatics of life should become visible even if a wise person has had little contact with the subdomain. In other words, subdomain-specific variations in amount of declarative knowledge and experience would primarily influence scores on the three general wisdom-related scales (good advice, rich knowledge, good life review).

Nevertheless, one avenue for further research is to explore with more force the role of the nature of problems used in a Life Review Task. Exemplars of such additional problem areas are health, finances, or social relations. These problem areas may entail a higher level of declarative knowledge and experience on the part of older subjects. As a consequence, a putative aging advantage on the general wisdom-related scales should more likely be obtained.

Rating as Method of Data Analysis

Much effort was invested in the development of the wisdom-related scales and the training of raters. Yet, the confinement of the present study to rating as the only method of evaluation is another possible limitation.

For example, a more micro-analytic content analysis of the protocols may offer an additional perspective on the nature of wisdom-related knowledge as contained in protocols of life review. Results of a content analysis conducted on the life planning data (Sörensen, 1987) using the wisdom-related criteria (contextualism, rich knowledge) as categories for a content analysis, by and large confirmed the pattern of results suggested by the rating scores obtained for the life planning protocols. Both kinds of analysis found no overall age differences, but within each age group performance tended to be best on the age-matched problem.

This similarity in results, however, may not be surprising as the wisdom-related criteria employed for the construction of the rating scales and the training of raters were also used as categories for the content analysis. Nevertheless, the analysis by Sörensen shows that the rating scores were not a chance result but rather can be traced back to certain segments of the text, and confirm the usefulness of the method of rating.

Still, other strategies of content analysis could be used to supplement this approach. A content analysis could, for example, aim at the detailed reconstruction of the knowledge system (network) represented in the text or try to reconstruct the argument structure and style using methods as described by Kintsch (1974) and Voss et al. (1985). In terms of the procedural aspects of life review, such a content analysis could analyze the life events mentioned (number, kind, density, extension), the explanations primarily used and also the evaluative tendencies visible in the response. A similar strategy was chosen for parts of the present data set to amplify results.

The exploratory inspection of 18 prompted parts of the life review protocol (see Chapter 5) supported the potential usefulness of such analyses. It seemed that young and old subjects quite often mentioned the same facts concerning a certain prompting question, but that the older subjects applied them in a more differentiated and realistic way, less schematically than younger subjects do. For example, when asked for the most important influences on the target person's life course, young and old subjects mentioned parents, school, society, but old subjects also added remarks such as "school is an important factor in the development of a child but one should not overestimate its effect, a psychologically healthy child is able to survive quite negative experiences with teachers unharmed" (Subject 71, p. 22; translation).[4] In general, the impression was that older participants offered quite a number of interspersed general insights about life beyond the scope of the life review constructed for the specific target person. The younger subjects conversely seemed to respond on the basis of the stimuli associated with the problem text. If one is willing to speculate, one could argue that these exploratory findings are suggestive of the conclusion that young adults seem to be at an earlier phase in the development of expertise in the fundamental pragmatics of life. They do not yet display a high level of procedural knowledge as would be shown in the integration of learned facts about life into the fictitious person's life as well as the utterance of maxims. Beyond the assessment of response structure, it seems to be worthwhile—according to this exploratory inspection—to analyze themes and content of, for example, the general insights mentioned or the problem solutions offered by subjects.

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[4] Protocol reprints are available from the author upon request: Max Planck Institute for Human Development and Education, Lentzeallee 94, 1000 Berlin 33.

Finally, with regard to gaining further insights into the rating process itself, one could conceive of a research program that focuses on the process of rating and rater training. Such a study could, for example, systematically vary raters on the dimension of expertise in life-span development, compare professional with lay experts, or it could systematically vary raters' chronological age.

Analyzed Data Sets

A limitation with regard to the data sets used for analyses is the confinement to the unprompted parts. Asking for a spontaneous response to the LRT provides a different response setting than asking prompting questions after the completion of the spontaneous response. A full analysis of the prompted parts of the life review protocol may add new features to the picture of subjects' knowledge about fundamental life pragmatics.

An exploratory inspection of a random sample of 18 prompted parts seemed to be especially interesting in terms of the responses to questions referring to the wisdom-related criterion "contextualistic thinking." Together with the scale "awareness of uncertainty," this criterion received lowest scores across conditions. However, when inspecting the respective prompting questions which asked for important influences on the target person's life in general and the historical and social influences in particular, the answers were mostly quite rich.

In conclusion, the inspection of a sample of prompted parts suggested that the spontaneous, unprompted answer may be under certain conditions further away from an individual's competence than the prompted answer. How much of the available competence is represented in the unprompted answer, however, will most likely depend on the individual's knowledge about fundamental life pragmatics, possibly on the individual's age, and on the wisdom-related criterion considered.

Further Thoughts About the Study

The results discussed so far gave rise to a number of further ideas concerning two major topics. First, the specific characteristics of older adults' knowledge about fundamental pragmatics of life, as suggested by the present study, are discussed. Second, possible critical conditions for the acquisition of knowledge in that domain and the role of life review in that acquisition process are considered.

Further Characterization of Older Adults' Knowledge About the Fundamental Pragmatics of Life

A major finding of the present study was the age difference on the scale "awareness of uncertainty." In the following, the aspect of the knowledge system, fundamental life pragmatics, presumably associated with this scale will be discussed in more detail. Protocols with a high-level performance on the scale "awareness of uncertainty" are used as a resource for this discussion.

All protocols with ratings of six and seven on the scale "awareness of uncertainty" — a total of nine protocols — were selected for closer inspection.[5] Six of these protocols were produced by older subjects, one protocol belonged to a young subject and two to middle-aged participants. Fortunately, although they had not been explicitly instructed to do so, both raters marked most of the statements on which they had based their judgement (only two protocols had to be excluded because raters had made no marks). The aspects of uncertainty captured in the older subjects' protocols resembled each other to a considerable degree. Therefore, three protocols of the total of six top protocols were randomly selected to represent the old age group. Table 21 (see below) illustrates the wisdom-related criterion "awareness of uncertainty" as present in top protocols.[6]

The protocol statements selected by the raters as indicating a high level of awareness of uncertainty can be characterized by three common features. First, these statements imply the recognition of the unpredictability of life as well as the impossibility of perfectly explaining past events or decisions. Second, the protocol statements refer to the coping mechanisms associated with this characteristic of life. The imperfect predictability and the indeterminacy of life is accepted, which as a consequence modifies a person's expectations of life. In a third step, it seems that a certain measure of "calmness" develops that enables the individual to accept past as well as future events without losing sight of one's goals.

In short, subjects who produced a high score on the scale "awareness of uncertainty" may be described as reconciling the paradox of flexibility versus determinism. The protocol statements suggest that those subjects have realized that the individual is not in *perfect* control of the happenings in his/her life. They do not, however, react to that realization by ceasing to plan, manage or review their lives and allowing things to happen with a feeling of helplessness. Rather, subjects with a high score on the scale "awareness of uncertainty" suggest that one continues to plan, manage, and review but with this limitation of effectiveness in mind.

This sense of indeterminacy of life is also a recurrent feature of published autobiographies (Handel, 1987). Koestler, in his autobiography, for example, considers in quite a mystical formulation the crucial question whether one is able to decipher the inchoate messages phrased in the "language of destiny" (1952, p. 305) and whether one is willing to follow the "commandments of the invisible text revealed for a split second to the inner self" (1954, p. 19). In the psychological literature, Bandura (1982), for example, pointed to the prominent role of chance encounters in shaping the course of human life.

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[5] Protocol reprints are available from the author upon request: Max Planck Institute for Human Development and Education, Lentzeallee 94, 1000 Berlin 33.

[6] It was not possible to quote all marked statements because sometimes meaningful units were not confined to one or two sentences but extended over a couple of pages. Thus, the table only presents the ideal units suitable for presentation within a table.

Table 21: Illustration of Wisdom-Related Criterion "Awareness of Uncertainty" by Subjects' Statements

Subject No. (Age Group)	Statement
40 (Young Age)	… The women had probably married too early without being aware of the consequences. But when she noticed (with two children), she decided to wait with the realization of her objectives until there was less pressure …
	… There are too many parameters involved in a decision which one can't estimate. New aspects come up or obstacles grow in front of you. Then, one has to be willing to act without insisting on original goals …
45 (Middle Age)	… She had once made this decision and now she has to find out whether she can still put up with it. Whenever a decision comes up, there are at least two possibilities but only one route can be taken and is then followed …
	… When the woman evaluates her decision, she should be aware that she decided at that time under certain given circumstances. She should not condemn her past decision but realize that conditions may have changed and that now she may decide differently …
62 (Old Age)	… Martha's life is described in an "either—or" pattern. I don't think that life is that way. I think one should strive for a "both—and" …
	… There are incidents in life like a chance acquaintance, a visit, a book etc. which are unforeseen and also not realized in their importance at that time. Only afterwards, they are recognized in their influence. These are events which one can't influence oneself but one should be open for their message …
71 (Old Age)	… Probably no young couple really knows what it means to have children. But once they are there, they have to cope with the responsibility and stay behind with their own wishes …
	… Pondering her decision to have children and a family, she will notice that things did not develop as she had imagined. But that is a fact of life. She nevertheless still approves of it and starts to think how, under present circumstances, she can now add aspects to her life which she missed so far …
82 (Old Age)	… Martha realizes that no emotional relationship remains stable, rather, any human relationship undergoes continuous change. She finally comes to accept that. Thus she is much better able to cope with the increasing emotional distance to her husband which in turn reduces the pressure put on her husband and enables him to be more open again …
	… Fortunately, no human being is able to foresee all the difficulties, emergencies, illnesses etc. that lie before him. One has to deal with them as they arise …

Note. Statements had been marked by raters and were selected from the protocols rated 6 or 7 on the scale "awareness of uncertainty."

Mastery of the uncertainties of life can also be related to general conceptions of successful coping with the paradoxes of life (e.g., dependence vs. independence, certainty vs. doubt) which seems to be an overarching feature of wisdom (i.e., expertise in fundamental life pragmatics). Bryce (1979) described the difficulty in maintaining faith when confronted with the injustices and paradoxes of life as being a central theme of Egyptian writings on wisdom (they are claimed to be the oldest known Western wisdom literature and date back to 2500 B.C.).

A central component in this process of mastering the paradoxes of life seems to be the integration of cognition and emotion. It has been proposed, for example, by Labouvie-Vief (1982, 1984) or Roodin, Rybash, and Hoyer (1984), and suggested by Isen (1984) and Dörner (1985, 1986) that with increasing maturity emotion and cognition are gradually integrated. Isen, for example, refers to the acquisition of strategies of mood-maintenance and mood-repair and Dörner discusses the issue in terms of self-management and self-monitoring during processes of problem solving. In the following, I will sketch a scenario concerning one specific version of this integration of emotion and cognition. This integration is suggested to be a critical component of expertise in the fundamental pragmatics of life (wisdom).

Starting from the model of skill acquisition (Anderson, 1982) used as an analogy for the life-span development of expertise, the development of expertise begins with the accumulation of declarative knowledge, that is, knowledge about fundamental life pragmatics. A person gathers experiences in many different life domains. By accumulation and reflection upon such experiences, the individual may acquire more refined knowledge about the inherent characteristics of the human nature (e. g., death, vulnerability, emotionality), he/she may learn about other human beings and inter-relations with them (e. g., betrayal, trust, help, manipulation). The individual, furthermore, may gain knowledge about him/herself (e. g., he/she learns about his/her assets and liabilities, his/her wishes, his/her emotional reactions). And, finally, he/she may be able to abstract knowledge about social rules and the make-up of society surrounding him/her.

With the accumulation of these aspects of knowledge, the person becomes better able to predict situations or behavioral outcomes, and will less likely be caught by surprise or, in terms of emotional reactions, will be better prepared. Put differently, it is less likely that he/she perceives or anticipates loss of control which, for example, Dörner, Reither, and Stäudel (1983) defined as a reason for emotional reaction. Relating these thoughts to our discussion of the dimension "awareness of uncertainty," one may conclude that once a person has realized that in life plans frequently don't work out as expected, the reaction will less likely be one of frustration or bitterness. Rather, since the emotional reaction is reduced or lacking at all, the individual remains open to recognizing possible positive aspects accompanying the unexpected.

In short, it is proposed here that the accumulation of experience as well as the higher-level processing of that experience is a precondition for the integration of emotions and cognition.[7] It seems, however, that some loss of emotional vividness may be related with this gain in control. This loss is depicted in the often-cited image of the somewhat detached and calm, wise person. It is further suggested that the integration of cognition and emotion is impossible if indirect life experience only is at one's disposal. Rather, the direct experience of situations of uncertainty, of frustrated plans, and of unsatisfactory explanations seems to be a necessary condition.

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[7] Since there exists a lively discussion concerning the terms "emotion" and "cognition," the position taken in the present work is presented. As Leventhal and Scherer (1987) have pointed out, the discussion whether emotion or cognition are dependent or independent processes and whether emotion or cognition is ontogenetically first, is largely a dispute of definition. Following these authors, it is the present author's position that emotions develop from "simple, reflex-like forms" to "complex cognitive-emotional patterns." It is these patterns that the term integration refers to. These patterns are characterized by a two-way street of influence between emotion and cognition (e. g., Dörner, 1985).

Life Review as a Critical Condition for the Acquisition of Knowledge About the Fundamental Pragmatics of Life

In the following, a second line of thoughts about the study is pursued. It will be argued that life review is not only a vehicle by which one can gain access to an individual's knowledge system, fundamental pragmatics of life, but also a critical condition for the acquisition of knowledge about the fundamental pragmatics of life. An attempt will be made to specify under which circumstances engaging in life review may further one's insight into life matters.

Denney (1982), in her theoretical account of cognitive development over the life span, focused on the direct link between exercise and expertise. In the present study, age groups did not differ in terms of the frequency with which they engaged in life review (exercise), but age groups differed in one aspect of the expertise in the knowledge domain "fundamental pragmatics of life," that is the awareness of uncertainty. With regard to the link between exercise and expertise, this finding suggests the necessity to specify under *which conditions* experience furthers *which aspects* of expertise.

In contrast to, for example, Salthouse (1985) we do not strive to disconfound age and experience in their relation to expertise. A life-span scholar would argue that it is exactly the increase in life experience that is at the core of living longer and, therefore, also at the core of intellectual aging/development. Rather, our goal is to specify critical experiences and critical conditions under which certain experiences (e.g., certain types of reflection brought on by experience, the cumulation of experiences within a certain period of time, mastery vs. failure) contribute to the acquisition of knowledge and finally expertise in the domain "fundamental pragmatics of life."

One assumption of the present research is that engaging in life review is not only one possible research avenue to a person's knowledge system about fundamental life pragmatics, but is also one such critical condition for acquiring knowledge about the fundamental pragmatics of life. It is critical because life review is by definition related to a selection, restructuring, and further analysis of life experiences. Life events are most likely put into categories like success or failure or grouped according to topics like relationship to authorities, intimate relationships, family, profession etc., or they are retrospectively ordered along a time dimension.

Simone de Beauvoir (1972), for example, has argued that it most likely takes a certain amount of life time in order to be able to execute processes like abstraction, categorization and grouping when doing life review. Similar thoughts were uttered by our participants, *irrespective* of age, when asked to describe possible changes in the way they had done life review in their own lives. The young subjects (25–35 years) already indicated that the process had become more intense and that "more pieces of the puzzle are to be better grouped and put together" (Subject 35, pp. 27).[8]

Reviewing one's life can also include the comparison with other life courses one knows about, or the comparison with theories concerning the development of life. On the one hand, such comparisons contribute to the evaluation of the life at stake (see also Goodnow, 1987): "Am I/is she still on-time with the happenings in my/her life? Are my/her goals worthwhile pursuing? Am I/is she using adequate means to reach my/her goals?" On the other hand, such comparisons are often critical for a true understanding of theoretical thoughts one has read or heard about and thus constitutes a meaningful inclusion into the individual's knowledge system "fundamental life pragmatics."

Accepting life review as one critical condition for the acquisition of knowledge in fundamental life pragmatics, leads to a string of further questions: Under which conditions do which kind of people engage in life review? Under which conditions does life review lead to the development of expertise in that knowledge domain?

A contention of the present work, following from the review of literature as well as the interviews with participants, is that it takes the unexpected, the hindrance of life plans (e. g., Wollheim, 1984) or the recognition of life patterns to reflect about life. In this way, Brandtstädter (1984, 1986) has proposed that we usually only begin to reflect upon our own development when confronted with problems of action orientation. Such problems of action orientation can be further specified as: (a) lack of orientation, (b) confrontation with a variety of orientations, and (c) incompatibility of orientations (Kempf & Aschenbach, 1981; Aschenbach, 1984).

As we have identified more specifically some of the issues that seem to trigger life review, the question is left under which conditions life review may further the development of expertise. I shall mention a couple of assumptions. One condition may be the amount and variety of knowledge (gained through direct or indirect experience) that a person has about fundamental life pragmatics. This knowledge serves as a rich background to the relativistic and contextualistic explanation and evaluation of life and the awareness of the uncertainty of the review itself. What are most likely conditions furthering the accumulation and the reflection upon such knowledge? Central seems to be the motivation to gain insights into life, to learn about the "winding paths of life." A further condition is probably the individual's ability to figuratively step back from oneself and perceive one's life rather realistically. This distance may also be achieved by others when life review is done in an interpersonal setting. As you may remember, Butler (1963) suggested personality characteristics like flexibility, resilience, and self-awareness as important for the success of life review. However, he defined success of life review not in terms of gaining expertise in knowledge about life but in terms of being adaptive for the psychological health of an individual.

Such considerations will have to inform the future development of theory and of measurement instruments concerning predictive variables productive of expertise in the knowledge domain fundamental pragmatics of life. So far, clarity exists only with regard to the quite general domains involved.

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[8] Protocol reprints are available from the author upon request: Max Planck Institute for Human Development and Education, Lentzeallee 94, 1000 Berlin 33.

Coming to a Full Circle

This thesis was begun by presenting the present study to the reader as being embedded in a system of interlocking frameworks. This line of reasoning is now brought to closure. In doing this, I recognize that this effort is as much guided by my commitment to finding solutions for a societal problem, and to the welfare of the aging population as it is by the results obtained in the present study.

Summarizing the findings of this study, it seems fair to say that the knowledge domain "fundamental life pragmatics" as accessed by the Life Review Task has the potential to be an area of intellectual functioning that evinces aging-related stability and even select growth. Thus, the study can be viewed as contributing to a more balanced picture of intellectual aging. It will be the task of further investigations to identify the critical conditions furthering growth of expertise in the knowledge system "fundamental pragmatics of life."

Moving away one step from the study in the system of interlocking frames, we are presented with the question of what the study can contribute to the societal implications of a growing aged population described in the opening chapter. The study demonstrated, I would suggest, that older adults indeed seem to have assets which can be of value for society. Furthermore, research can try to identify critical conditions supporting stability and growth in the pragmatics of intelligence across the life span. Such information could form the basis of preventive work aimed at normal and successful aging and the reduction of disease-related aging. This reduction of age-related diseases would most likely result in a decreasing financial burden for society.

In this respect, life review is considered a process which, on the one hand, may further the development of an individual's knowledge about life. On the other hand, it is suggested that life review may also be used as a resource by society. In a scientific framework, oral history projects conducted in recent years are a good example of this (Niethammer, 1980). But also on a more informal basis, the life review of older people in a conversational setting with younger adults may be a way of drawing on the resources of older adults with respect to their knowledge about life (Mergler & Goldstein, 1983).

Over the last few years, a number of initiatives came into being, some of which strive to either use older adults as a resource or to offer preventive measures with a view to normal aging. For example, in West Berlin the Senate is financing a project entitled "Making use of the experience of older adults," launched in 1987 under the auspices of the German Center for Questions on Aging (Deutsches Zentrum für Altersfragen). Within the larger framework of this project, a number of subprojects have been described and partially also already started: consumer counselling, counselling of young employers or young free professionals, cooperation for a "productive" retirement, knowledge store (Wissensladen, Wissensbörse), center for services provided by older adults (e.g., baby-sitting, house-sitting, taking care of older children), summer university with and for older adults etc. Such and similar initiatives have also been described in the UN report on "The world aging situation: Strategies and policies" (1985) that had been cited in the introduction.

In sum, this study recommends the following two issues to the reader's further deliberation. First, psychological research seems to provide evidence that suggests the adequacy of a more balanced view of aging which could supercede the still prevalent negative aging stereotype. Second, this more balanced view of aging would open up the possibility for a variety of individual and societal action. In terms of the individual, people may give some thought to the question concerning their own impact on the course of their development/aging. In terms of society, a number of measures can be considered: Scientific knowledge about aging, for example, could find its way into school curricula; employment and retirement regulations could be handled in a more flexible way; and more of the initiatives described above could be designed and realized.

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Appendix A
Life Review Interview

Session 1

In der nun folgenden Untersuchung sind wir daran interessiert, was Sie über das Leben und seine Entwicklung wissen. Wir sind an Ihren diesbezüglichen Erfahrungen interessiert. In der Hauptaufgabe der Studie wird es darum gehen, daß Sie versuchen sich vorzustellen, wie der Lebensrückblick einer fiktiven, in der Aufgabe beschriebenen Person aussehen könnte.

Um zu erfahren, was Sie während der Bearbeitung der Aufgabe denken, möchten wir Sie bitten, *laut zu denken.* Damit meine ich, daß Sie mir alles sagen, was Ihnen durch den Kopf geht von dem Zeitpunkt an, wo Sie die Aufgabe das erste Mal lesen, bis zu dem Zeitpunkt an dem Sie nichts mehr dazu sagen möchten. Ich würde Sie bitten, ständig zu sprechen während Sie die Aufgabe bearbeiten. Bitte planen Sie nicht, was Sie sagen wollen und versuchen Sie auch nicht es zu erklären. Vielleicht stellen Sie sich einfach vor, Sie wären allein in einem Zimmer und sprächen mit sich selbst. Es könnte sein, daß es hilfreich ist, etwas langsamer als gewöhnlich zu denken, da Sie ja Ihre Gedanken auch aussprechen sollen. Es ist sehr wichtig für uns, daß Sie kontinuierlich sprechen. Deshalb werde ich Sie bitten weiterzusprechen, falls Sie einmal länger schweigen sollten. Wir sind also sowohl an Ihrer Lösung der Aufgabe interessiert, als auch daran, über welche Gedanken Sie zu der Lösung kommen. Ist verständlich geworden, was mit lautem Denken gemeint ist? Haben Sie noch Fragen dazu?

Gut. Dann fangen wir jetzt zunächst mit zwei Aufgaben zum lauten Denken an. So können Sie sich etwas an diese Methode gewöhnen, bevor wir an die Hauptaufgabe gehen. Bitte lesen Sie die Aufgabe zunächst laut vor. Sie brauchen nicht mitzuzählen, das übernehme ich für Sie.

Nennen Sie 20 Tiernamen.
(Vp bekommt die Aufgabe auf Karte vorgelegt.)

Sehr gut. Versuchen Sie jetzt bitte, sich an Ihren Gedankengang während der Bearbeitung der Aufgabe zu erinnern.

Was waren Ihre Hauptschritte? Es geht uns nicht darum, woran Sie hätten denken müssen, sondern darum woran Sie tatsächlich während der Bearbeitung gedacht haben.

Es werden jetzt noch zwei Übungsaufgaben folgen, bevor wir zu der Hauptaufgabe kommen. Wie gerade eben, möchte ich Sie wieder bitten, daß Sie über die jeweilige Aufgabe laut nachdenken und möglichst nicht aufhören zu sprechen, während Sie die Aufgabe bearbeiten.

Nun also zur zweiten Aufgabe:

Stellen Sie sich vor, Sie sind bei sich zu Hause und möchten zur Gedächtniskirche. Wie oft müßten Sie auf dem Weg dorthin nach rechts beziehungsweise links abbiegen?
(Vp bekommt die Aufgabe auf Karte vorgelegt.)

Sehr schön, vielen Dank. Bitte versuchen Sie, sich jetzt wieder an die Hauptschritte Ihres Gedankenganges während der Bearbeitung der Aufgabe zu erinnern.
Die nun folgenden beiden Übungsaufgaben sind der Hauptaufgabe sehr viel ähnlicher als die ersten beiden und sollen Sie etwas auf diese Art von Aufgabe einstimmen. Es gibt bei diesen Aufgaben keine richtigen und falschen Lösungen und auch keinen bestimmten Zeitpunkt, an dem die Bearbeitung der Aufgabe abgeschlossen wäre. Sie müssen selbst bestimmen, wann Sie nichts mehr zu der Aufgabe sagen möchten.

Wie in der Hauptaufgabe geht es darum, sich eine fiktive Person vorzustellen. Die fiktive Person sollten Sie möglichst aus verschiedenen, Ihnen zur Verfügung stehenden Wissens- und Erfahrungsquellen „zusammenbasteln". Achten Sie bitte außerdem darauf, daß Sie so detailliert wie möglich antworten, so realitätsnah wie möglich und sich bei der Bearbeitung möglichst auf Ihr eigenes Wissen über das Leben und seine Entwicklung beziehen und weniger auf allgemeine soziale Erwartungen.

Bevor ich Ihnen nun die Aufgabe gebe, möchte ich Sie bitten, um Mißverständnisse zu vermeiden, daß Sie mir in Ihren eigenen Worten wiederholen, wie Sie die Aufgabenstellung verstanden haben.

(Antwort der Vp. Eventuelle Mißverständnisse klären.)

Beginnen Sie bitte damit, daß Sie die Aufgabe laut lesen.

(Holiday Problem)
Stellen Sie sich vor, eine Frau fährt schon seit einigen Jahren mit ihrer Familie an einen bestimmten Urlaubsort. Eines Tages wird sie vom dortigen Fremdenverkehrsamt gebeten ihre bisherigen Erfahrungen an diesem Urlaubsort aufzuschreiben.
An welche Dinge könnte sich die Frau erinnern, wenn sie über die früheren, an diesem Ort verbrachten Ferien zurückblickt?
Wie könnte sie die verschiedenen Dinge erklären? Welche Zusammenhänge könnte sie sehen?
Wie könnte sie rückblickend die an diesem Ort verbrachten Ferien beurteilen und warum?
(Vp bekommt die Aufgabe auf Karte.)

(Ersatzaufgabe falls Vp große Schwierigkeiten mit der Urlaubsaufgabe hat: Clothing Store Problem.)
Stellen Sie sich vor, eine Frau geht schon seit Jahren mit ihrer Familie zum Einkaufen der Kleidung in ein bestimmtes Bekleidungsgeschäft. Dieses Geschäft feiert nun sein 50jähriges Bestehen. Aus diesem Anlaß wird die Frau, als treue Kundin des Geschäfts, zu einem Empfang eingeladen. Bei dieser Gelegenheit fragt sie der Geschäftsführer nach ihren bisherigen Erfahrungen mit dem Haus.

Gut, vielen Dank. Könnten Sie mir jetzt bitte sagen, wie Sie bei der Aufgabenbearbeitung vorgegangen sind, an welche Hauptschritte in Ihrem Gedankengang Sie sich erinnern? Könnten Sie sich auch noch an die Ereignisse einerseits und die Erklärungen und Bewertungen andererseits erinnern, die Sie nannten?
(Reihenfolge dieser beiden Fragen ist flexibel zu handhaben, je nach Reaktion der Vp auf die erste Frage.)

Könnten Sie sagen auf welche Wissensquelle Sie sich bei der Konstruktion der fiktiven Person hauptsächlich bezogen haben? (eigenes Leben, Leben anderer Personen, Medien)

Nach den Übungsproblemen, die Sie auf diese Art von Problemstellung einstimmen sollten, kommen wir nun zu der Hauptaufgabe der Untersuchung. Wie anfangs schon kurz erwähnt, geht es in dieser Aufgabe darum, Lebensrückblick zu halten. Unter Lebensrückblick verstehen wir in dieser Studie sowohl die Rekonstruktion des Lebensablaufs, als auch den Versuch die rekonstruierte Lebensgeschichte zu erklären und zu bewerten.

Normalerweise hält man einen solchen Lebensrückblick für das eigene Leben, wenn man zum Beispiel eine Entscheidung treffen muß oder wenn eine nahestehende Person stirbt usw. In dieser Untersuchung möchten wir Sie jedoch bitten, diesen Rückblick für das Leben einer fiktiven, aber doch lebenstypischen in der Aufgabe beschriebenen Person zu halten. Wie gerade bei den Übungsaufgaben besteht Ihre Aufgabe also darin, sich in diese fiktive, aber lebenstypische Person hineinzuversetzen und sich sowohl vorzustellen an welche Ereignisse aus ihrem Leben sich die fiktive Person bei einem Lebensrückblick erinnern könnte, als auch wie Sie das Zustandekommen dieser Ereignisse erklären und wie Sie diese Ereignisse rückblickend bewerten könnte.

Achten Sie bitte wieder darauf, den Lebensrückblick so detailliert und realistisch wie möglich zu gestalten. Und ziehen Sie bitte für Ihre Gestaltung nicht hauptsächlich soziale Erwartungen, sondern vor allem Ihre Erfahrungen und Ihr Wissen über das Leben, seine Entwicklung und seine Probleme heran. Nehmen Sie sich jedoch auch nicht nur eine bestimmte Person, die Sie kennen als Vorbild und erzählen deren Leben nach.

Bevor ich Ihnen nun die Aufgabe gebe, könnten Sie bitte kurz in Ihren eigenen Worten beschreiben, wie sie die Aufgabenstellung verstanden haben, um Mißverständnisse zu vermeiden.

(Antwort der Vp.)

Ja genau. Und bitte vergessen Sie nicht, daß Sie bitte besonders auf folgende Dinge während der Bearbeitung achten: Nennen Sie Ereignisse aus dem Leben der fiktiven Person und geben Sie dazu auch Erklärungen und Bewertungen ab; bearbeiten Sie die Aufgabe möglichst detailliert, möglichst realitätsnah und beziehen Sie sich vor allem auf Ihr eigenes Wissen über das Leben und seine Entwicklung. Erzählen Sie aber bitte nicht das Leben einer bestimmten Person nach.

Hier ist nun die Aufgabe. Beginnen Sie bitte wieder damit, daß Sie die Aufgabe laut lesen.

Target Review Age: „young"

Eine junge Frau hat sich für die Familie und gegen den Beruf entschieden. Sie ist verheiratet und hat Kinder bekommen.
Eines Tages trifft sie nun eine Freundin von früher, die sie lange nicht gesehen hat. Die Freundin hat sich gegen die Familie und für den Beruf entschieden. Sie ist dabei, sich in einem Beruf zu etablieren.

Target Review Age: „middle-aged"

Eine Frau mittleren Alters hatte sich gegen den Beruf und für die Familie entschieden. Die Kinder sind jetzt gerade dabei, das Elternhaus zu verlassen.
Eines Tages trifft sie eine Freundin von früher, die sie lange nicht gesehen hat. Die Freundin hatte sich gegen die Familie und für den Beruf entschieden. Sie hat sich in einem Beruf etabliert.

Target Review Age: „old"

Eine ältere Frau hatte sich gegen den Beruf und für die Familie entschieden. Die Kinder sind schon seit einiger Zeit aus dem Haus.
Eines Tages trifft sie eine Freundin von früher, die sie lange nicht gesehen hat. Die Freundin hatte sich gegen die Familie und für den Beruf entschieden. Sie lebt jetzt seit einiger Zeit im Ruhestand.

Task Refrain

Dieses Treffen regt die Frau an, über ihr bisheriges Leben nachzudenken. Wie könnte ein solcher Lebensrückblick aussehen? (positiv/negativ, durchschnittlich/außergewöhnlich)
An welche Aspekte aus ihrem Leben könnte sie sich erinnern? (Entscheidungen, Probleme/Lösungen, wichtige Personen, Gefühle, förderliche und hinderliche Ereignisse)
Wie könnte sie ihren Lebensablauf erklären? Welche Gründe könnte sie für ihr Handeln nennen? (Zusammenhänge, roter Faden)
Wie könnte sie rückblickend ihr Leben bewerten? Hat sie das erreicht, was sie sich vorgestellt hat?

(Jede Vp bekommt **eines** der Zielalter zusammen mit dem Aufgaben-Refrain auf Karte vorgelegt.)
(Antwort der Vp.)

Standardized Interventions

1. Falls Vp nur gegenwärtige Situation der Frau beschrieben hat: Sie haben mir jetzt bisher die gegenwärtige Situation der Frau beschrieben, könnten Sie sich auch vorstellen, einerseits an welche Ereignisse sich diese Frau bei einem Lebensrückblick erinnern könnte und andererseits wie sie das Zustandekommen der Ereignisse erklären und wie sie diese Ereignisse rückblickend bewerten könnte?
2. Falls auch diese Intervention nicht zu einem Lebensrückblick führt: einzelnes Ansprechen der Stichworte im Aufgaben-Refrain.

Vielen Dank. Könnten Sie nun zunächst versuchen, sich bitte an den Aufgabentext zu erinnern und mir so genau wie möglich seinen Wortlaut wiedergeben?

Danke. Ich möchte Sie jetzt auch noch bitten, mir zu sagen, wie Sie bei der Aufgabenbearbeitung vorgegangen sind, was waren die Hauptschritte Ihres Gedankengangs?

Können Sie sich noch an die hauptsächlichen Ereignisse einerseits und Erklärungen und Bewertungen andererseits erinnern?

Könnten Sie sagen, welches die hauptsächliche Wissensquelle war, auf die Sie sich für die Konstruktion dieses Lebensrückblicks bezogen haben? (eigenes Leben, Leben anderer Personen, Medien)

Session 2

Zu Beginn des heutigen Gesprächs möchte ich noch einmal auf den von Ihnen konstruierten Lebensrückblick zurückkommen und Ihnen dazu ein paar Fragen stellen.

Bitte versuchen Sie zunächst, sich an das von Ihnen konstruierte Leben der fiktiven Person zu erinnern und fassen Sie es bitte noch einmal kurz zusammen.
(Vp faßt konstruierten Lebensrückblick zusammen, im Anschluß daran folgende Fragen stellen.)

Prompting Questions

1. Was würden Sie sagen, sind die wichtigsten Punkte in diesem Leben?
2. Könnten Sie sich vorstellen, welche anderen Verläufe dieses Leben noch hätte nehmen können?
3. Was sehen Sie als den oder die entscheidenden Einflüsse für den Verlauf des Lebens dieser Frau an?
4. Wie sehen Sie den geschichtlichen und gesellschaftlichen Einfluß auf diesen Lebensablauf?
5. Welche Absichten, welche Ziele und Werte hat die Frau in ihrem bisherigen Leben verfolgt? Haben sich diese im Laufe ihres Lebens verändert?
6. Welches Verständnis meinen Sie, hat die Frau von sich selbst?
7. Was, meinen Sie, könnten Bestandteile der Menschenkenntnis der Frau sein?
8. Welche Einsichten könnte die Frau im Laufe ihres Lebens gewonnen haben?

Damit haben wir diesen Teil der Untersuchung abgeschlossen und wir kommen nun zu allgemeineren Fragen über Lebensrückblick.

Life Review Questionnaire

1. Was verstehen Sie unter Lebensrückblick?
2. Was sind für Sie Anlässe Lebensrückblick zu halten?
3. Warum halten Sie bei solchen Anlässen Lebensrückblick? Was bringt es Ihnen, wenn Sie Lebensrückblick halten?
4. Würden Sie sagen, daß Sie im Vergleich zu jemandem Ihres Alters häufig Lebensrückblick halten? (überdurchschnittlich, durchschnittlich, unterdurchschnittlich häufig)
5. Würden Sie sagen, daß diese Häufigkeit im Laufe Ihres bisherigen Lebens variiert hat?
6. Falls ja, können Sie sich erinnern wann die Häufigkeit besonders hoch und wann niedrig war? Warum?
7. Hat sich die Art und Weise wie Sie Lebensrückblick halten, in Ihrem bisherigen Leben verändert? Meinen Sie, es gibt verschiedene Formen von Lebensrückblick?

8. Empfinden Sie es für sich als schwierig, Lebensrückblick zu halten? Warum?
9. Empfanden Sie es als schwierig, den Lebensrückblick für Martha zu halten?
10. Man hört immer wieder, daß von weisen Personen oder von der Weisheit des Alters gesprochen wird. Was verstehen Sie unter diesen Begriffen?
11. Kennen Sie weise Personen? Können Sie erklären, warum Sie diese Person als weise bezeichnen?

(Im Anschluß an diese Fragen zum Lebensrückblick werden die folgenden psychologischen Verfahren angewendet.)

Psychologische Testverfahren
(in der Reihenfolge der Präsentation)

I. Verbale Intelligenz (HAWIE Wortschatztest)
II. Fluide Intelligenz (APM)
PAUSE (je nach Bedürfnis)
III. Persönlichkeitsfragebogen (NEO)
IV. Biographischer Fragebogen

Zum Schluß dieser zweiten Sitzung haben wir jetzt noch einige Aufgaben und Fragen, die es uns ermöglichen sollen, innerhalb unserer Stichprobe besser vergleichen zu können. Bei den ersten Aufgaben geht es um die verbale Ausdrucksfähigkeit und um logisches Denken. Wir brauchen diese Aufgaben, um nachweisen zu können, daß sich unsere Teilnehmer darin nicht unterscheiden, daß also Unterschiede in den konstruierten Lebensrückblicken nicht darauf zurückzuführen sind.
(Vorlegen des HAWIE Wortschatztests; Instruktion entsprechend dem HAWIE Mannual.)

Bei den nun folgenden Aufgaben geht es um logisches Denken. Hier sind zunächst einige Beispiele.
(Durcharbeiten der Beispiele nach abgedruckter Instruktion; Vorlegen der Aufgaben.)

Vielleicht machen wir eine kurze Pause, denn diese Aufgaben erfordern schon einiges an Konzentration, oder?
(Je nach Reaktion der Vp Pause oder nicht.)

Jetzt haben wir noch eine Reihe von Fragen, die sich auf Ihre Einstellungen und Interessen beziehen. Zu den meisten Fragen kann man unterschiedlicher Meinung sein: Der eine meint, daß Geld nicht glücklich macht, der andere wird ihm widersprechen. Manche Leute ziehen im Umgang zurückhaltende Menschen vor, andere nicht usw. Eine „richtige" Antwort gibt es zu solchen Fragen nicht. Jeder hat seine eigene Meinung dazu. Im folgenden möchten wir gern ihre Meinung zu einer Reihe von solchen Fragen erfahren, um auch diesbezüglich zwischen den Frauen, die an dieser Studie teilnehmen, besser vergleichen zu können. Denn Einstellungen und Interessen können durchaus einen Einfluß darauf haben, wie man Ereignisse wahrnimmt und verarbeitet. Unterschiede in Einstellungen und Interessen können sich auch auf die Konstruktion des Lebensrückblicks in der Aufgabe ausgewirkt haben.

Zu jeder Frage gibt es fünf Antwortmöglichkeiten: stimmt völlig, stimmt, unentschieden/dazwischen, stimmt nicht, stimmt überhaupt nicht. Ihre Antwort notieren Sie

bitte auf dem Antwortblatt. Es ist wichtig, daß Sie nicht zu lange über die Fragen nachdenken, sondern Ihre spontane Antwort geben. Die Beantwortung der Fragen sollte nicht länger als ungefähr zwanzig Minuten dauern. Bitte überlegen Sie nicht, mit welchen Antworten Sie vielleicht den besten Eindruck machen, sondern kreuzen Sie entsprechend Ihrer spontanen Meinung an. Manche Fragen enthalten nicht alle Einzelheiten, die man wissen müßte, wenn man sich wirklich gründlich entscheiden wollte. Die Antwortmöglichkeit „unentschieden/dazwischen" sollten Sie bitte nur dann wählen, wenn Sie sich wirklich nicht entscheiden können. Beantworten Sie bitte jede Frage, auch wenn eine Frage vielleicht nicht so auf Sie zutrifft. Einzelne Fragen mögen Ihnen vielleicht etwas persönlich erscheinen, aber wir werten nicht die einzelnen Antworten, sondern die Summe aus und das nicht unter ihrem Namen, sondern unter Ihrer Codenummer. Natürlich werden alle Unterlagen streng vertraulich behandelt. Haben Sie noch Fragen?
Zum Schluß haben wir hier noch einen Biographischen Fragebogen. Dazu brauchen wir zunächst Ihre Codenummer und einige Angaben zur Person.
(Ausfüllen der entsprechenden Items.)

Dann haben wir hier eine Liste von Ereignissen zusammengestellt, die man im Laufe eines Lebens erleben kann. Wir sind nun daran interessiert, welche dieser Ereignisse Sie als wichtig erlebt haben. Und eventuell auch ob Sie sie öfters als einmal erlebt haben. Die Ereignisse sind nach Bereichen gegliedert und Sie finden für jeden Bereich auch eine Zeile mit „Sonstiges", wo sie Ereignisse eintragen können, die Sie als wichtig erlebt haben, die jedoch nicht erwähnt sind. Das ist für uns von Interesse, da die Art und Anzahl der Ereignisse, die Sie schon erlebt haben, Einfluß auf Ihre Konstruktion des Lebensrückblicks in der Aufgabe gehabt haben kann.
(Vp geht die Ereignisliste durch und kreuzt die ersten beiden Spalten entsprechend an.)

Wir haben hier noch eine dritte Spalte. In dieser sollen Sie bitte ankreuzen, welche der Ereignisse Sie besonders dazu angeregt haben, über Ihr Leben oder das Leben allgemein nachzudenken.

Damit wären wir am Ende unserer Untersuchung und ich möchte mich sehr herzlich für Ihre Mitarbeit bedanken.

Appendix B

Rater Training

1. Allgemeine Einführung

1.1 Allgemeine Hinweise zum Vorgang der Urteilsbildung beziehungsweise zur Einschätzung von Objekten

„Das war aber kein gutes Buch!" sagt ein Leser enttäuscht, nachdem er den neuesten Roman eines Bestseller-Autors gelesen hatte.

Solche und ähnliche Urteile bilden wir im Alltag ständig, meistens ohne viel über den Prozeß der Eindrucksbildung nachzudenken, der dem jeweiligen Urteil vorausging. Auf solche Weise beurteilen wir Gelesenes, Gesehenes und Gehörtes.

Ihre Aufgabe in dem Forschungsprojekt, auf das ich gleich noch eingehen werde, ist genau diese Urteilsbildung, ist genauer die Einschätzung, die Beurteilung von Gelesenem. Allerdings geben wir Ihnen die Kriterien, die Sie zur Beurteilung heranziehen sollen, vor, und wir werden Sie auch bitten, Ihr Urteil anhand einer Einschätzskala in einer Zahl auszudrücken. Insofern wird der alltägliche Urteilsbildungsprozeß also in vielleicht etwas ungewohnter Weise systematisiert.

Damit Sie mit dieser Art der Systematisierung vertraut werden, haben wir vor die eigentliche Beurteilung der Protokolle ein paar allgemeine Einschätzaufgaben gesetzt, zu denen wir jetzt dann gleich kommen werden. Wir möchten Sie also bitten, Ihre Expertise im Hinblick auf das Wissen über das Leben sowie die menschliche Fähigkeit, auch sehr komplexe Zusammenhänge beurteilen zu können, in den Dienst unseres Forschungsprojekts zu stellen. Wir hoffen dadurch, eine möglichst genaue Abbildung der Qualität der uns vorliegenden Protokolle im Hinblick auf die von uns entwickelten Beurteilungsdimensionen zu erhalten.

1.2 Hinweise und Erklärungen zu Beurteilungsfehlern

(Kopien dieses Gliederungspunktes austeilen)

Zwar hat der Mensch diese einzigartige Fähigkeit, komplizierte Sachverhalte zu beurteilen, doch können bei solchen Einschätzungen immer wieder Fehler und Verzerrungen auftreten. Auf einige der wichtigsten Beurteilungsfehler möchte ich im folgenden kurz eingehen.

Mildefehler

Beurteiler, die den gleichen Gegenstand zur Einschätzung vorliegen haben, können sich generell darin unterscheiden, wie „milde" oder wie „streng" sie bewerten. Ein

„milder“ Beurteiler wird vor allem den positiven Bereich der Schätzskala benutzen, das heißt den Gegenstand zu gut beurteilen. Ein „strenger“ Beurteiler wird vor allem den negativen Bereich in Anspruch nehmen, den Gegenstand also zu schlecht beurteilen.

Eine Variante des Milde- beziehungsweise Strengefehlers besteht darin, daß man den eigenen Standard während des Einschätzens verändert, daß man also strenger oder milder wird in seinen Urteilen. Das gleiche zahlenmäßige Urteil bedeutet dann verschiedenes, je nach dem Zeitpunkt, an dem es abgegeben wurde.

Wir möchten Sie bitten, auf diese Tendenz bei sich selbst zu achten und, falls sie Ihnen auffällt, sie zu kontrollieren, indem Sie gezielt versuchen, möglichst nicht nur eine Hälfte der Skala für Ihre Urteile heranzuziehen (eventuell Beispiele aus dem ersten Rating der Pilotprotokolle).

Tendenz zur Mitte, Scheu vor den Extremen

Bei Beurteilungen mittels Einschätzskalen fällt auch immer wieder auf, daß die Beurteiler die beiden extremen Enden der Skala scheuen und es vorziehen, sich mit ihren Urteilen im Mittelbereich zu bewegen. Vielleicht mit der Idee im Hinterkopf, „damit mache ich nicht viel falsch“.

Auch hier wieder die Bitte, daß Sie Ihr Urteilsverhalten daraufhin beobachten und versuchen zu kontrollieren. Sie sollten sich dabei bewußt machen, daß Sie keine richtige oder falsche Bewertung abgeben können, sondern daß es uns auf Ihre Wahrnehmung des Protokolls ankommt. Haben Sie also keine Scheu, den Ihnen angemessen erscheinenden Wert zuzuteilen.

Wechselwirkung zwischen Beurteiler und zu beurteilendem Material

Diese Art der Urteilsverzerrung bezieht sich auf die Positition des Urteilers selbst auf der von ihm zu beurteilenden Dimension. Es kann diesbezüglich entweder ein „Ähnlichkeitsfehler“ auftreten, wenn die Ausprägung der zu beurteilenden Objekte in Richtung auf die eigene Merkmalsausprägung verschätzt wird (z. B. wenn der Urteiler selbst unordentlich ist, nimmt er andere auch unordentlicher wahr), oder es kann ein „Kontrastfehler“ auftreten, wenn der Urteiler selbst eine extreme Merkmalsausprägung hat und die Ausprägung anderer dann in Richtung auf das gegensätzliche Extrem verschätzt (z. B. wenn der Urteiler selbst äußerst vorsichtig ist, schätzt er andere risikofreudiger ein, als sie es sind).

Wegen dieser Urteilstendenz werden wir später bei der Vorbereitung der Einschätzung der Protokolle zusammen ein ideales Protokoll erstellen, das Sie dann als Bezugspunkt für Ihre Urteile heranziehen können, anstelle dessen, wie Sie vielleicht selbst die Aufgabe gelöst hätten. Versuchen Sie dann später, immer dieses Idealprotokoll bei Ihrer Beurteilung heranzuziehen.

Position des zu beurteilenden Objekts in der Abfolge der Beurteilungen

Eine weitere Verzerrung des Urteils ist möglich durch die Reihenfolge, in der die Objekte, in unserem Falle die Protokolle, beurteilt werden. Wenn zum Beispiel das erste Objekt eine extrem positive oder negative Merkmalsausprägung hat, so beeinflußt das möglicherweise die Beurteilung der nachfolgenden Objekte insofern, daß sie unter- beziehungsweise überschätzt werden. Sie sollten also bitte versuchen, jedes Protokoll für sich gegen das später noch zu entwickelnde Idealprotokoll zu beurteilen.

1.3 Hinweise zu der Studie „Lebensweisheit und Lebensrückblick" und zur Lebensrückblick-Aufgabe

Nach diesen ersten Bemerkungen zu Ihrer Aufgabe und Ihrer Bedeutung für unser Projekt möchte ich Sie jetzt einführen in die Fragestellung und Vorgehensweise unserer Studie. Die Protokolle, die wir Ihnen zur Beurteilung vorlegen werden, stammen aus einer Studie, die sich mit dem „Wissen über das Leben" beschäftigt.

Wir arbeiteten dabei mit drei Altersgruppen, jungen Frauen, Frauen mittleren Alters und älteren Frauen. Eine Studie mit Männern ist für die Zukunft geplant. Um Zugang zu diesem „Wissen über das Leben" zu erhalten, wurden drei Aufgaben zum Lebensrückblick entwickelt. Diesem Vorgehen liegt die Annahme zugrunde, daß in der Bearbeitung von Aufgaben zum Lebensrückblick das Wissen beziehungsweise ein Ausschnitt aus dem Wissen einer Person über das Leben deutlich wird.

In allen drei Aufgaben geht es darum, den Lebensrückblick für eine fiktive Frau, namens Martha, zu entwerfen. Die drei Aufgaben unterscheiden sich im wesentlichen hinsichtlich des Alters von Martha. Martha ist einmal jung (ca. 30 Jahre), einmal im mittleren Alter (ca. 50 Jahre), und einmal ist Martha eine ältere Frau (ca. 70 Jahre). Die Länge des Lebens und der historisch-kulturelle Kontext, der in den drei Aufgaben berücksichtigt werden soll, variiert also zwischen den drei Aufgaben. Ich möchte Sie bitten, das später bei Ihren Einschätzungen zu bedenken. Die Antwort soll immer relativ zu der gestellten Aufgabe beurteilt werden und nicht hinsichtlich dessen, was überhaupt in einem Lebensrückblick gesagt werden könnte. Sie bekommen die genaue Aufgabenstellung später noch in die Hand. Zu Beginn jedes Protokolls liest die jeweilige Teilnehmerin außerdem die Aufgabe auch noch einmal laut vor. Die Aufgabe ist dabei so formuliert, daß das Thema „Beruf versus Familie" im Mittelpunkt steht. Es ist vielleicht wichtig, schon hier anzumerken, daß Sie später bei der Beurteilung der Protokolle sich nicht primär davon leiten lassen sollten, welche Stellungnahme zu dem Problem „Beruf versus Familie" in dem Protokoll deutlich wird, sondern vor allem auf die Skalenbeschreibung achten, die Sie vorher erhalten haben, anhand derer Sie die Protokolle einschätzen sollen.

Ein Wort sei auch noch zu dem Stil der Protokolle gesagt. Die Teilnehmerinnen wurden gebeten, über die gestellte Aufgabe laut nachzudenken. In den meisten Fällen finden Sie also keine wohl-formulierten, durchkonstruierten Sätze, sondern eine Aneinanderreihung von Gedanken, Abbruch von Gedanken und Überspringen zu einem anderen, Wiederaufgreifen eines Gedankens etwas später usw. Einen ersten Eindruck haben Sie ja schon durch das Einschätzen der Protokolle im Anschluß an die einführende Gruppendiskussion erhalten. Die Protokolle variieren jedoch darin, in welchem Ausmaß sie solche Charakteristika zeigen. Die Ausprägung dieser Charakteristika sollte nicht Gegenstand Ihrer Beurteilung sein. Versuchen Sie bitte, auch wenn es mehr Mühe macht, manche Protokolle zu lesen als andere, Ihr Urteil davon nicht beeinflussen zu lassen. Vielleicht hilft es auch beim Lesen, wenn man eine innere Stimme mitsprechen läßt.

2. Allgemeine Übungen zum Beurteilen mit Hilfe von Einschätzskalen*

2.1 Das Einschätzen einfacher Sachverhalte

Diese erste Übung soll dazu dienen, daß Sie ein Gefühl für die 7stufige Skala entwickeln, mit der wir arbeiten wollen. Versuchen Sie bitte, bei dieser Aufgabe die gesamte Skala auszunutzen. Alles weitere steht auf dem Bogen, den ich Ihnen jetzt austeile. Bitte tragen Sie Ihre Urteile in die dafür vorgesehenen Spalten ein. Wir diskutieren dann im Anschluß darüber.

2.2 Das Einschätzen von Texten

Als nächsten Schritt auf unserem Weg zu den Protokollen wollen wir jetzt mit geschriebenem Material, mit Texten und mit etwas komplexeren Beurteilungsdimensionen arbeiten. In der Mappe, die ich Ihnen austeile, finden Sie fünf Texte sowie einen Einschätzbogen und ein Blatt mit der Beschreibung der beiden Dimensionen. Lesen Sie bitte zunächst die beiden Beschreibungen durch, damit wir eventuelle Unklarheiten noch beseitigen können.

Wichtig ist also zum Beispiel bei der ersten Dimension, daß Sie sich zunächst ein Bild von einem prototypischen Märchen machen, wie es in unserer Gesellschaft verstanden wird. Die fünf Texte sollten Sie daraufhin mit diesem Prototyp vergleichen und entscheiden, wie ähnlich sie diesem sind.

2.3 Hinweise zur Bearbeitung der Protokolle

Bei früheren Studien hat sich gezeigt, daß es hilfreich sein kann, sich während des Lesens Notizen zu machen oder sich Textstellen zu markieren. Besonders bei längeren Texten erleichtern solche Maßnahmen den Prozeß der Urteilsbildung. Eine weitere Vereinfachung der Urteilsbildung könnte darin bestehen, zunächst zu entscheiden, ob das Protokoll in der Mitte oder an einem der beiden Enden der Skala angesiedelt ist, und erst nach dieser groben Vorentscheidung in die feinere Differenzierung des Urteils zu gehen.

3. Erläuterungen und Übungen zu der Beurteilungsdimension, die auf die Protokolle der Studie angewendet werden sollen*

Nachdem Sie jetzt, wie ich hoffe, vertraut sind mit dem Instrument der numerischen Schätzskala und der Beurteilung von Texten, kommen wir zu der eigentlichen Beurteilungsdimension, anhand derer Sie die Protokolle aus der Studie „Lebensweisheit und

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*Training material can be obtained from the author upon request: Max Planck Institute for Human Development and Education, Lentzeallee 94, 1000 Berlin 33.

Lebensrückblick" einschätzen sollen, wobei es für Sie vielleicht wichtig ist zu wissen, daß es insgesamt sechs verschiedene Dimensionen gibt, die zur Beurteilung der Protokolle herangezogen werden. Sie sollen mit der Dimension, die ich Ihnen gleich geben werde, also nur einen Aspekt beurteilen.

Ich teile Ihnen jetzt zunächst die allgemeine Beschreibung der Dimension sowie die Handhabungsanleitung für die beiden extremen und den mittleren Skalenpunkt aus. Lesen Sie bitte beides erst einmal durch.

Ich gebe Ihnen jetzt noch die drei Aufgabentexte, wie sie in der Studie zur Anwendung kamen, und möchte Sie bitten, daß wir nun versuchen, ein für diese Beurteilungsdimension ideales Protokoll zu entwerfen. Mit idealem Protokoll meine ich eine Antwort auf diese Aufgaben, die im Hinblick auf die Dimension perfekt ist.

Die Antwort zu den drei Aufgabenversionen sind zwar in bestimmten Aspekten verschieden, doch vornehmlich nicht auf dem Niveau, das die Beurteilungsdimension betrifft. Deshalb würde ich vorschlagen, daß wir uns ein ideales Protokoll überlegen und eventuelle Unterschiede bezüglich der drei Marthas bei der Diskussion einfließen lassen. Drei getrennte Idealprotokolle zu erstellen, würde in weiten Teilen Überschneidung und Redundanz bringen.

Es ist vielleicht nützlich, wenn Sie sich im Hinblick auf das ideale Protokoll einige Notizen machen, die Sie dann später für Ihre Beurteilung zur Verfügung haben. Es wird später so sein, daß Sie immer alle Antworten einer Martha-Version zusammen zur Beurteilung bekommen, so daß Sie sich auf die jeweilige Art der Antwort einstellen können. Jedoch sollte der Hauptbezugspunkt für Ihre Beurteilung immer der Vergleich mit dem diskutierten Idealprotokoll sein. Nach unserer Diskussion werde ich Ihnen auch noch ein Blatt mit Beispielsätzen aus einem idealen Protokoll austeilen. Vielleicht könnte zunächst jeder von Ihnen sagen, was ihm zu einer idealen Antwort im Hinblick auf die Dimension einfällt.

Im Anschluß an diese Diskussion teile ich Ihnen dann zwei Beispielprotokolle aus, die Sie bitte anhand der erarbeiteten Dimension mit dem diskutierten Idealprotokoll vergleichen und einschätzen sollen.

3.1 Allgemeine Diskussionsstichpunkte

- Welches sind die drei historisch-kulturellen Kontexte der drei Marthas?
- Vor allem bei der Aufgabe „junge Martha" kann es durchaus sein, daß es weniger Möglichkeiten gibt, sich bezüglich der Dimension zu äußern. Deshalb muß man genau lesen, gerade bei Unsicherheit und Relativismus können die Anzeichen in der Art der Formulierung oder in Nebensätzen stecken.
- Bezüglich „good life review" könnte es sein, daß bei junger Martha ein höheres Niveau an Details genannt wird.
- Generell muß man sich kontrollieren, daß nicht die Länge (je länger, desto besser) oder der Erzählstil (je mehr geschlossene Geschichte, desto besser) zentral werden für die Beurteilung, sondern zentral muß die Dimensionsbeschreibung bleiben.

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3.2 Dimensionenspezifische Diskussionsstichpunkte

3.2.1 Sicheres Urteil und guter Rat in schwierigen Lebensfragen

Dies ist eine Dimension, bei der man nur schwierig ein konkretes Protokoll konstruieren kann. Die Beurteilung liegt bei dieser Dimension eher darin, sich einen Gesamteindruck von der Person zu bilden, die das Protokoll verfaßt hat eben anhand ihrer Äußerungen in diesem Protokoll.

Also gewinnt man aus den Aussagen zum Beispiel den Eindruck, daß diese Frau über schwierige Lebensprobleme nachgedacht hat und auch zu wertvollen Einsichten gekommen ist. Oder hat man den Eindruck aus dem Protokoll, daß die Person versucht, sich in Martha hineinzuversetzen und weniger nur aus eigener Sicht das Leben Marthas betrachtet.

3.2.2 Reichhaltiges Wissen über die Hintergründe des Lebens

In einem bezüglich dieser Dimension idealen Protokoll sollten folgende Dinge genannt sein:

- Die Möglichkeit des plötzlichen Auftretens von Krankheiten, Unfällen oder Tod;
- Berücksichtigung der Tatsache, daß der Mensch nicht isoliert lebt, sondern in menschlicher, physikalischer und geschichtlich-kultureller Umgebung.
- Es sollte deutlich werden, daß es wichtig ist zu wissen, was man will, was man gut kann, worin man schlecht ist, Stärken/Schwächen, wie man in den verschiedenen Situationen reagiert.
- Es sollte die Tatsache berücksichtigt sein, daß der Mensch altert und welche Auswirkungen damit verbunden sein können.
- Es sollte deutlich werden, daß es wichtig ist, Menschenkenntnis zu besitzen, damit ist zum Beispiel gemeint, daß man einschätzen kann, wie andere Menschen wahrscheinlich reagieren, wie sie wiederum Einfluß auf das eigene Verhalten haben, wie sie einen fördern oder behindern können, wie man den Faktor „Mitmensch“ in eigenen Überlegungen berücksichtigen sollte.
- Es sollte deutlich werden, wie gesellschaftliche Bedingungen auf das Leben Einfluß nehmen (welche Normen sind vorherrschend) oder es zumindest versuchen, gepaart mit der Erkenntnis, daß es Fälle gibt, in denen ein Abweichen von solchen Normen angezeigt ist (Nennung von Beispielen).

3.2.3 Reichhaltiges Wissen über Lebensrückblick

In einem bezüglich dieser Dimension idealen Protokoll sollte

- der Lebenslauf von Martha zwar nicht bis ins letzte Detail, doch in den wesentlichen Punkten klar sein, man sollte sich vorstellen können, was Martha in ihrem bisherigen Leben gemacht hat und was ihr widerfahren ist. Es ist dabei egal, in welcher Reihenfolge das Leben dargestellt wird, ob von vorne oder von hinten oder über-

haupt nicht chronologisch, sondern in Episoden; der Rückblick kann konkret wie eine Geschichte erzählt sein oder eher abstrakt die wichtigen zu berücksichtigenden Aspekte nennen;
- für die wichtigsten Entscheidungen in Marthas Leben Erklärungen gegeben worden sein, das heißt man sollte nachvollziehen können, warum Martha in dieser Situation so gehandelt hat;
- zu den Entscheidungen und auch zum gesamten bisherigen Lebenslauf begründet Stellung genommen worden sein, das heißt es sollte vom heutigen Standpunkt rückblickend bewertet worden sein; es kommt hierbei nicht auf die „Richtigkeit" beziehungsweise „Relativität" der Erklärungen und Bewertungen an, sondern darauf, daß es überhaupt gemacht wird, die Bewertungen können also durchaus dogmatisch sein.

3.2.4 Kontextuelles Denken

Ein hinsichtlich dieser Dimension ideales Protokoll sollte folgendes enthalten:
- Entscheidung darüber, welche Lebensbereiche und Gesichtspunkte für die Fragestellung, also den Lebensrückblick der Martha wichtig sind, wobei das Dilemma zwischen Familie und Beruf im Zentrum steht, also nicht nur die Aufzählung so vieler Lebenskontexte wie möglich.
- Es sollen die Kontexte nicht einfach nur genannt werden, sondern es sollen die Konsequenzen für Martha deutlich werden.
- Es soll deutlich werden, wie sich die verschiedenen Bereiche aufeinander auswirken (z. B. historische Bedingungen auf Beruf, Familie und Beruf, Freundeskreis und Ehe, Kinder und Freundeskreis usw.).
- Wie haben sich diese Lebensbereiche bisher entwickelt, auch in ihren Beziehungen zueinander, wann sind bestimmte Bereiche bedeutend geworden, wann sind andere verschwunden.
- Welche Konflikte kann es geben zwischen den Bereichen und wie kann man unter Setzung von Prioritäten für einen bestimmten Zeitraum zu Lösungen kommen.
- Es muß deutlich werden, daß trotz des Setzens von Prioritäten die anderen Bereiche nicht aus dem Auge verloren werden sollten (z. B. Beruf während Familie oder Freunde während Partnerschaft).

3.2.5 Relativierendes Denken

In einem hinsichtlich dieser Dimension idealen Protokoll sollte folgendes enthalten sein:
- Es wird deutlich, daß Martha aufgrund von Familienhintergrund, gesellschaftlichen und historischen Bedingungen, Persönlichkeit usw. bestimmte Werte und Ziele verfolgt, daß das aber nicht die einzig möglichen sind, sondern unter anderen Umständen auch andere Ziele und Werte vorliegen würden.
- Doch die Darstellung ist keinesfalls so, daß gesagt wird, alles ist relativ und deshalb kann man überhaupt nichts über das Leben von Martha sagen, sondern es wird

deutlich, daß man unter der Spezifikation der vorliegenden Bedingungen auch einen Lebenslauf nachzeichnen kann.
- Man sollte den Eindruck bekommen, daß die Protokollverfasserin fähig ist, von ihren eigenen Werten und Zielen abzusehen und sich auch andere Möglichkeiten vorstellen kann oder daß zumindest die Relativität des eigenen Standpunkts deutlich wird.

3.2.6 Denken, das die Unsicherheiten im Leben berücksichtigt

Ein hinsichtlich dieser Dimension ideales Protokoll sollte folgendes enthalten:
- Es wird deutlich, wie schwierig es ist, im Leben perfekt zu planen, da es immer Unbekannte in der Rechnung gibt und Unvorhergesehenes eintritt, daß man zum Beispiel nicht weiß, wie eine bestimmte Person reagiert, oder ob ein bestimmtes Ereignis eintreten wird oder nicht, ob eine Beziehung Bestand haben wird oder nicht, ob sich ein bestimmter Einsatz für eine Sache lohnt oder nicht, ob man Erfolg haben wird oder nicht, ob man mit einer Entscheidung glücklich sein wird oder nicht.
- Trotz all dieser Unwägbarkeiten wird in dem Protokoll auch deutlich, daß man sich trotzdem entscheiden muß, daß man handeln muß im Leben und ein gewisses Risiko in Kauf nehmen muß.
- Es wird deutlich, daß man im Leben nicht mit Stabilität von Verhältnissen rechnen darf, sondern mit Veränderung rechnen muß und bereit sein muß, sich auf die veränderte Situation einzustellen.
- Entscheidungen werden aus diesen Gründen also nicht ein für alle Mal getroffen, sondern man sollte sie immer wieder an den momentanen Gegebenheiten überprüfen und gegebenenfalls revidieren, wobei es die Kunst ist zu erkennen, bis zu welchem Punkt man festhalten sollte und ab wann man sich umorientieren sollte.
- Bei dieser Dimension wird es im einzelnen Protokoll nicht sehr viele Äußerungen geben, die darauf zutreffen. Deshalb ist ein sehr gutes Protokoll schon ein solches, das zumindest einmal von den Unsicherheiten spricht und auch sagt, wie man mit ihnen umgehen soll.

Appendix C
Rating Tools

1. Dimension Descriptions

1.1 Beschreibung der Dimension: „Sicheres Urteil und guter Rat in schwierigen Lebensfragen“

Es gibt Personen, die besondere Einsichten und sicheres Urteil im Hinblick auf schwierige Probleme des Lebens haben und von daher auch guten Rat in Lebensfragen geben können. Lassen Sie nun, nachdem Sie das Protokoll gelesen haben, dieses in seiner Gesamtheit auf sich wirken.

In welchem Ausmaß glauben Sie, entspricht die Verfasserin des Protokolls einer solchen Person, die besondere Einsichten und sicheres Urteil hat und von daher auch guten Rat in schwierigen Lebensfragen geben kann?

1.2 Beschreibung der Dimension: „Reichhaltiges Wissen über die Hintergründe des Lebens“

Es gibt Personen, die sehr umfangreiches Wissen über die Hintergründe des Lebens haben. Mit „Wissen über die Hintergründe des Lebens“ ist beispielsweise gemeint:

- *Wissen um die Bedingungen menschlicher Existenz*, also zum Beispiel, daß Menschen sterblich sind, daß sie altern, der menschliche Körper verletztlich ist, daß Menschen Gefühle haben und in jeweils in einem bestimmten kulturellen und historischen Kontext leben.
- *Selbsterkenntnis eines Menschen* im Hinblick darauf, welche Vorzüge und welche Fehler man hat, was man eigentlich will, wie man in bestimmten Situationen reagiert usw.
- *Wissen über zwischenmenschlichen Umgang*, also zum Beispiel, wie reagieren andere Personen in bestimmten Situationen, was wollen andere Personen usw. (Menschenkenntnis) oder auch die Bedeutsamkeit anderer Personen für das Leben des Menschen.
- *Wissen über soziale, gesellschaftliche Normen* und deren Bedeutung für das menschliche Leben, aber auch über die Begrenztheit der Bedeutung, das heißt wann von diesen abgewichen werden kann oder soll. Also an welche Regeln muß man sich anpassen und von welchen Regeln oder unter welchen Umständen kann und sollte man von Normen abweichen.

In welchem Ausmaß glauben Sie, wird in diesem Protokoll solches Wissen um die Hintergründe des Lebens deutlich?

1.3 Beschreibung der Dimension: „Reichhaltiges Wissen über Lebensrückblick“

Es gibt Personen, die es sehr gut verstehen über ein Leben zurückzublicken. Sie können den Lebensablauf schlüssig rekonstruieren und darüber hinaus aber auch erklären wieso es zu einem solchen Ablauf kam und wie dieser Ablauf rückblickend zu bewerten ist.

In welchem Ausmaß glauben Sie, sind in dem hier für Martha konstruierten Lebensrückblick solche Qualitäten repräsentiert?

1.4 Beschreibung der Dimension: „Kontextuelles Denken“

Wenn man in schwierigen Lebensfragen zu einem guten Urteil kommen will, sollte man die Person oder Situation nicht isoliert betrachten, sondern man sollte kontextuell denken (den Einzelnen im Kontext seines Lebens sehen). Mit „kontextuellem Denken“ ist dabei gemeint, daß man im Leben einer Person zum Beispiel berücksichtigt wo sie lebt, aus welcher Familie sie stammt, welche Lebensbereiche in ihrem Leben eine Rolle spielen (Familie, Arbeit, Freizeit usw.), welche Freunde sie hat, wo sie arbeitet usw. Da es eine große Anzahl potentiell wichtiger Kontexte gibt, gehört zu „kontextuellem Denken“ auch zu entscheiden, welche Kontexte für die jeweilige Problemstellung, für das jeweilige Leben relevant sind.

Es reicht dabei nicht aus, dieses Zusammenspiel verschiedener Aspekte des Lebens in seiner Bedeutung für den Zustand zum gegenwärtigen Zeitpunkt zu erkennen, sondern es müssen darüber hinaus auch die Auswirkungen der einzelnen Bereiche aufeinander in der Zukunft und die Geschichte des Zusammenspiels dieser Aspekte in der Vergangenheit berücksichtigt werden.

Bei einem solchen Zusammenspiel verschiedener Bereiche des Lebens kann es immer wieder zu Spannungen und sogar Konflikten kommen. „Kontextuelles Denken“ beinhaltet deshalb auch, daß man die wechselnde Bedeutung der einzelnen Aspekte im Lebensablauf erkennt und dementsprechend zeitlich abhängige Prioritäten setzt, um zu einer Lösung der Konflikte zu kommen.

In welchem Ausmaß glauben Sie, wird in dem vorliegenden Protokoll dieses kontextuelle Denken deutlich, das erkennt welche Lebensbereiche aus Vergangenheit, Gegenwart und Zukunft im Hinblick auf die jeweilige Lebensfrage eine Rolle spielen und wie diese aufeinander abzustimmen sind?

1.5 Beschreibung der Dimension: „Relativierendes Denken“

Wenn man in schwierigen Lebensfragen zu einem guten Urteil kommen will, sollte man auf relativierende Weise über das jeweilige Problem nachdenken.

Mit „relativierendem Denken“ ist gemeint, daß man berücksichtigt, wie abhängig Entscheidungen und damit Lebensverläufe von den Werten einer Person, deren Umfeld und der Gesellschaft, in der diese Person lebt, sind. Es gibt also in schwierigen Lebensfragen selten eine generell „richtige“ Entscheidung. Eine Entscheidung läßt sich nur dann treffen, wenn man zum Beispiel Wissen über die Werte einer Person und deren soziale Einbettung besitzt.

Mit „relativierendem Denken" ist dabei nicht nur das Wissen um solche Abhängigkeiten gemeint. Hinzu kommt auch noch die Abstraktion von eigenen Erfahrungen und Wertvorstellungen und die Bereitschaft, die Bedeutung anderer Wertvorstellungen zu verstehen und anzuerkennen.

In welchem Ausmaß glauben Sie, wird in dem vorliegenden Protokoll dieses relativierende Denken deutlich, das erkennt, daß Entscheidungen und Lebensverläufe sich nicht absolut, sondern nur relativ zu einer bestimmten Person und deren Lebenssituation als gut beurteilen lassen?

1.6 Beschreibung der Dimension: „Denken, das die Unsicherheiten im Leben berücksichtigt"

Wenn man in schwierigen Lebensfragen zu einem guten Urteil kommen will, sollte man die vielen Unsicherheiten, die mit dem jeweiligen Problem verbunden sind, berücksichtigen. Mit der „Berücksichtigung von Unsicherheiten" ist gemeint, daß man erkannt hat, wie begrenzt das eigene Wissen über das Leben ist, man aber dennoch leben muß und mit Unerwartetem umgehen können muß. Die Berücksichtigung der Unsicherheiten im Leben beinhaltet die Erkenntnis, daß sich Problemsituationen im Leben nicht in allen Bestandteilen klären lassen und daß sich Lebensabläufe nicht perfekt vorhersagen lassen. Dementsprechend müssen getroffene Entscheidungen entsprechend neuer Erkenntnisse oder sich verändernder Bedingungen wieder hinterfragt und gegebenenfalls revidiert werden. Wenn man die Unsicherheiten des Lebens berücksichtigt, erwartet man keinen verläßlichen Zustand im Leben, sondern rechnet von vornherein mit Veränderung und kann auch damit umgehen.

In welchem Ausmaß glauben Sie, wird in dem vorliegenden Protokoll diese Berücksichtigung von Unsicherheiten im Leben deutlich, die erkennt, daß es im Leben keine absolute Sicherheit gibt, man aber dennoch Entscheidungen fällen und handeln muß?

2. Application Rules

2.1 Handhabungsanleitung für drei Skalenpunkte der Dimension: „Sicheres Urteil und guter Rat in schwierigen Lebensfragen"

1	2	3	4	5	6	7
sehr gering			durch-schnittlich			sehr groß

Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung" und „sehr große Übereinstimmung".

Skalen-punkt

1 Sehr geringe Übereinstimmung mit der idealen Person.

Man gewinnt den Eindruck, daß sie relativ rigide eine Einstellung verfolgt und auch keine oder sehr wenig wertvolle Einsichten zu vermitteln hat und kaum die Fähigkeit besitzt, sich in andere Personen einzufühlen. Man würde es nicht in Erwägung ziehen, diese Person um Rat zu fragen.

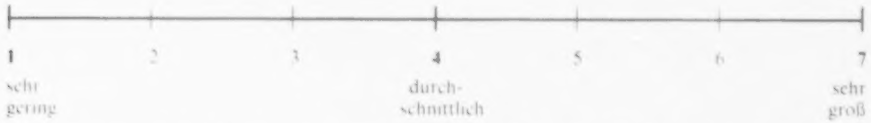
4 Durchschnittliche Übereinstimmung mit der idealen Person.

Manchmal kann sie andere Gesichtspunkte wahrnehmen, dann fällt sie wieder auf ihren dogmatischen Standpunkt zurück. Sie bleibt oberflächlich in ihren Betrachtungen, so daß man den Eindruck gewinnt, sie hat nicht gründlich nachgedacht oder ist nicht zu wertvollen Einsichten gelangt. Man würde es jedoch vielleicht in Erwägung ziehen, diese Person um Rat zu fragen, wenn man keine andere Alternative hätte.

7 Sehr große Übereinstimmung mit der idealen Person.

Die Person wäre ein sehr guter Ansprechpartner, wenn man jemanden um Rat fragen wollte. Man hat den Eindruck, daß sie wertvolle Einsichten gewonnen hat, es sehr gut versteht, sich in eine andere Person hineinzuversetzen und nicht dogmatisch versucht, eine bestimmte Meinung durchzusetzen.

2.2 Handhabungsanleitung für drei Skalenpunkte der Dimension: ‚Reichhaltiges Wissen über die Hintergründe des Lebens"



Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung" und „sehr große Übereinstimmung".

Skalen-punkt

1 Sehr geringe Übereinstimmung mit dem Idealprotokoll.

Es werden nur die schon durch die Aufgabenstellung angesprochenen Lebenskontexte und -bereiche erwähnt. Tod, Krankheit oder Unfall als mögliche Einflußgrößen in einem Leben werden nicht erwähnt. Das Thema „Selbsterkenntnis" findet keine oder nur rudimentäre Berücksichtigung. Kaum etwas wird über die Kenntnis anderer Menschen gesagt. Es werden keine oder kaum soziale Normen genannt, die sich auf Marthas Leben auswirken, und es wird nicht auf die Möglichkeit hingewiesen, daß man in bestimmten Fällen sich den Normen entziehen kann.

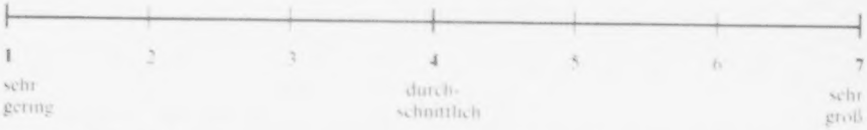
4 Durchschnittliche Übereinstimmung mit dem Idealprotokoll.

Ein Teil der für das ideale Protokoll diskutierten Wissenselemente (Selbsterkenntnis, Menschenkenntnis, soziale Normen, Tod/Unfall/ Krankheit) wird deutlich, ein anderer Teil nicht. Es kann auch sein, daß fast alle Elemente erwähnt werden, jedoch nur sehr oberflächlich, ohne konkret zu werden oder Beispiele zu nennen.

7 Sehr große Übereinstimmung mit dem Idealprotokoll.

Fast alle Wissenselemente sind genannt und auch in gewissem Maße elaboriert. Also es wird gesprochen über: Tod, Krankheit und Unfall als mögliche Ereignisse im menschlichen Leben; über den Kontext, in dem Martha eingebettet ist und zwar über das hinaus, was im Aufgabentext sowieso angesprochen wird; darüber, wie Martha versucht, sich klar zu werden, was sie will, was sie kann usw.; darüber, was Martha über andere Menschen und deren Verhalten weiß oder auch nicht weiß; und schließlich auch darüber, welche gesellschaftlichen Normen Einfluß auf Marthas Leben gehabt haben könnten und in welchen Fällen Martha sich über solche Normen hinweggesetzt haben könnte.

2.3 Handhabungsanleitung für drei Skalenpunkte der Dimension: „Reichhaltiges Wissen über Lebensrückblick"



Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung" und „sehr große Übereinstimmung".

Skalenpunkt	
1	Sehr geringe Übereinstimmung mit dem Idealprotokoll. Es wird hauptsächlich Marthas gegenwärtige Situation beschrieben, über ihren bisherigen Lebenslauf erfährt man kaum etwas. Es werden keine oder nur rudimentäre Erklärungen und Bewertungen abgegeben.
4	Durchschnittliche Übereinstimmung mit dem Idealprotokoll. Es wird einigermaßen deutlich, wie Marthas Leben bisher abgelaufen ist, doch fehlen Erklärung und Bewertung weitgehend. Es kann zum Beispiel sein, daß einfach positiv oder negativ bewertet wird, ohne eine weitere Begründung dafür abzugeben. Oder aber Marthas Leben beginnt erst mit der Heirat. Ab diesem Punkt ist es dann jedoch recht gut dargestellt auch mit Erklärung und Bewertung.
7	Sehr große Übereinstimmung mit dem Idealprotokoll. Man kann sich Marthas Leben von Beginn bis zum Zeitpunkt des Rückblicks gut vorstellen und es werden Erklärungen dazu abgegeben, warum das Leben diesen oder jenen Verlauf hatte. Es können auch mehrere Alternativen dargestellt werden. Schließlich wird Marthas Leben auch rückblickend bewertet beziehungsweise es werden die verschiedenen Möglichkeiten der Bewertung aufgezeigt.

2.4 Handhabungsanleitung für drei Skalenpunkte der Dimension: „Kontextuelles Denken"

1	2	3	4	5	6	7
sehr gering			durch-schnittlich			sehr groß

Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung" und „sehr große Übereinstimmung".

Skalenpunkt

1 Sehr geringe Übereinstimmung mit dem Idealprotokoll.

Es wird nur über die Bereiche Beruf und Familie gesprochen, die schon in der Aufgabenstellung selbst angesprochen werden. Außerdem werden die Beziehungen zwischen den genannten Bereichen nicht oder nur kaum problematisiert und keine Entwicklung dieser Bereiche von der Vergangenheit über die Gegenwart in die Zukunft aufgezeigt.

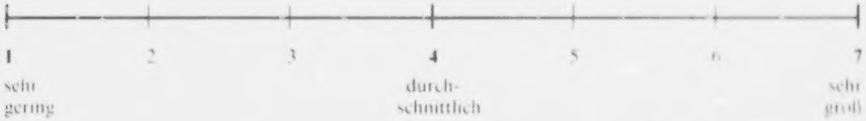
4 Durchschnittliche Übereinstimmung mit dem Idealprotokoll.

Die Beziehungen der verschiedenen Lebensbereiche zueinander werden nicht problematisiert. Es werden zwar viele verschiedene Lebensbereiche und Gesichtspunkte (z. B. geschichtliche und kulturelle Situationen, Partnerschaft, Elternhaus, Freundeskreis, Freizeit usw.) genannt, aber es wird nicht begründet, welche die wichtigsten sind und es wird auch nicht aufgezeigt, daß die Wichtigkeit sich mit der Zeit verändern kann. Die Verknüpfung zwischen Martha und dem jeweiligen Kontext wird nicht oder nur ansatzweise dargestellt (z. B. wie sich eine bestimmte geschichtliche Konstellation auf Martha auswirkt).

7 Sehr große Übereinstimmung mit dem Idealprotokoll.

Es wird begründet, welche die für die gestellte Aufgabe wichtigen Lebensbereiche und Gesichtspunkte sind, die man berücksichtigen muß. Es werden die möglichen Konflikte zwischen den Bereichen dargestellt. Es werden Prioritäten gesetzt, ohne die anderen Bereiche aus den Augen zu verlieren. Es wird dargestellt, wie sich die verschiedenen Bereiche in der Vergangenheit entwickelt haben. Es wird dargestellt, welche Kontexte und welches Wissen zu jeder Altersstufe gehören kann und welche noch nicht. Die Auswirkungen der Kontexte auf Martha werden konkret dargestellt.

2.5 Handhabungsanleitung für drei Skalenpunkte der Dimension: „Relativierendes Denken“



Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung“ und „sehr große Übereinstimmung“.

Skalenpunkt

1 Sehr geringe Übereinstimmung mit dem diskutierten Idealprotokoll.

Marthas Leben wird so dargestellt, als könnte es nur dieses eine geben und kein anderes. Die Abhängigkeiten der Werte und Ziele Marthas von bestimmten Bedingungen werden nicht oder nur sehr rudimentär aufgezeigt. Die eigenen Werte der Versuchsperson werden als Absolutum gesetzt. Es findet keine Problematisierung der Entscheidung Marthas für die Familie statt.

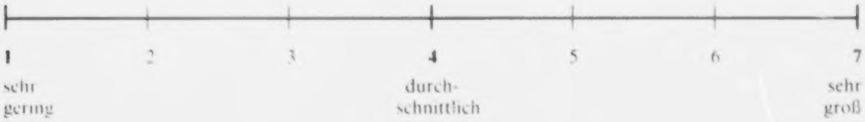
4 Durchschnittliche Übereinstimmung mit dem Idealprotokoll.

Es wird zwar erkannt, daß es viele Möglichkeiten gibt, wie das Leben Marthas aussehen könnte. Doch es bleibt dabei, vor dieser potentiellen Vielfalt zu kapitulieren und keine Version wird konkret durchgespielt beziehungsweise es wird nicht aufgezeigt, welche Bedingungen zu welchem Lebenslauf führen können.

7 Sehr große Übereinstimmung mit dem Idealprotokoll.

Es werden eine oder mehrere Versionen von Marthas Zielen, Werten und Entscheidungen in ihren Abhängigkeiten von entsprechenden Faktoren wie Zeit, Elternhaus, Gesellschaft usw. dargestellt. Es wird deutlich, daß die Verfasserin des Protokolls sich von ihren eigenen Werten distanzieren kann.

2.6 Handhabungsanleitung für drei Skalenpunkte der Dimension: „Denken, das Unsicherheiten im Leben berücksichtigt“



Die Zahlen auf der Skala repräsentieren gleichabständige Stufungen zwischen den beiden extremen Ausmaßen „sehr geringe Übereinstimmung“ und „sehr große Übereinstimmung“.

Skalenpunkt

1 Sehr geringe Übereinstimmung mit dem Idealprotokoll.

Das Leben wird so dargestellt, als ob es planbar wäre und der Mensch die volle Kontrolle besitzen kann, wenn er/sie das will oder die Thematik „Sicherheit versus Unsicherheit in der Lebensführung und -planung“ taucht gar nicht auf.

4 Durchschnittliche Übereinstimmung mit dem Idealprotokoll.

Es wird zwar erkannt, daß es im Leben viele Unwägbarkeiten gibt, aber es werden keine Lösungen für das Umgehen mit diesen Unsicherheiten angeboten.

7 Sehr große Übereinstimmung mit dem Idealprotokoll.

Es werden Unsicherheiten konkret benannt *und* es wird darauf eingegangen wie man damit umgehen kann: daß man also zum Beispiel ein bestimmtes Risiko auf sich nehmen muß; daß man Entscheidungen immer wieder daraufhin hinterfragen muß, ob sie noch angemessen sind; daß man mit unvorhergesehenen Entwicklungen rechnen und umgehen können muß.

3. Example Sentences of Ideal Protocol

3.1 Beispielsätze aus einem Idealprotokoll für die Dimension: „Reichhaltiges Wissen über die Hintergründe des Lebens"

- „.... dann kann natürlich auch noch alles anders verlaufen, wenn zum Beispiel Martha schwer krank wird oder ihr Mann oder eines der Kinder. Oder vielleicht sogar stirbt der Mann oder hat einen Unfall ..."
- „.... Vielleicht muß sich Martha auch um gebrechlich werdende Eltern kümmern ..."
- „.... Martha wußte zu dem Zeitpunkt noch gar nicht, was sie mit ihrem Leben machen wollte ..."

  „.... Martha wurde sich erst mit der Zeit ihrer Stärken und Schwächen bewußt und lernte damit umzugehen ..."
- „.... Martha konnte gut einschätzen, wie ihr Mann auf ihre Entscheidung reagieren würde und ging deshalb ganz vorsichtig zu Werke ..."

  „.... Martha hatte Schwierigkeiten, andere Menschen einzuschätzen. Erst mit der Zeit gewann sie da an Erfahrung ..."

  „.... Ein Deutschlehrer in Marthas Schulzeit hatte besonderen Einfluß auf sie, er weckte in ihr das Interesse für Literatur ..."
- „.... Es war damals sehr schwer für eine Frau, eine weiterführende Ausbildung zu bekommen oder gar zu studieren. Es herrschte die Meinung vor, die heiratet ja doch ..."

  „.... Martha widersetzte sich der Norm, daß Mutterschaft das Höchste im Leben einer Frau sei, sie wollte kein Mutterkreuz. Sie schloß erst ihre Ausbildung ab und arbeitete mit Freude in ihrem Beruf ..."
- „.... Martha hatte erkannt, daß ihre Stärke nicht die Durchsetzungskraft im Beruf war und mit Mittelmäßigkeit wollte sie sich nicht begnügen, so entschied sie sich, sich auf die Kinder zu konzentrieren, obwohl das eigentlich in der öffentlichen Meinung als altmodisch und unter der Würde einer Frau galt ..."

3.2 Beispielsätze aus einem Idealprotokoll für die Dimension: „Reichhaltiges Wissen über Lebensrückblick"

- „.... Martha kann sich aus ganz verschiedenen Gründen für die Ehe und Familie entschieden haben: Sie hatte vielleicht kein schönes Elternhaus und möchte es eigenen Kindern besser machen oder sie sieht da gar keine Alternative, sondern es ist für sie die Aufgabe der Frau ..."
- „.... Martha denkt zurück an ihre Heirat und dann die Geburten der beiden Kinder und stellt fest, daß sie das nicht im eigentlichen Sinne geplant, sondern daß es geschehen ist, daß sie halt ihren Mann kennengelernt hat und sich verliebt hat und wenig weiter darüber nachgedacht hat ..."
- „.... Wenn Martha heute so zurückdenkt, wundert sie sich über sich selbst, wie wenig überlegt und vorausschauend und dagegen wie emotional sie damals eine so wich-

tige Entscheidung getroffen hat. Dennoch ist es nicht so, daß sie ihre Entscheidung bereut, sie weiß nur, daß sie heute jetzt neue Wege für sich suchen muß ..."

- „.... Martha blickt zurück und ist rund herum zufrieden. Sie fühlt sich wohl mit ihrem Leben, hat ihr Bestes an die Kinder und den Mann gegeben und lebt jetzt ruhig mit ihrem Mann ..."
- „.... ‚Das war ein Fehler', denkt Martha rückblickend, ‚die Ausbildung abzubrechen. Jetzt muß ich mir alles sehr hart neu erarbeiten' ..."
- „.... Martha wurde als zweite von drei Geschwistern geboren. Ihr Vater ist Beamter, die Mutter Hausfrau ..."
  „.... Man sollte berücksichtigen, ob Martha Geschwister hatte oder ob sie als Einzelkind aufgewachsen ist. Ob beide Eltern arbeiteten und überhaupt anwesend waren ..."

(→ also der Lebenslauf kann konkret oder abstrakt anhand wichtiger Aspekte dargestellt werden)

3.3 Beispielsätze aus einem Idealprotokoll für die Dimension: „Kontextuelles Denken"

- „.... Martha wurde also etwa 1916 geboren, dann hat sie zwei Weltkriege mitgemacht, dadurch kann sie sehr früh zur Verantwortung herangezogen worden sein, kann früh mit dem Tod konfrontiert worden sein, hatte es schwer, geregelte Ausbildung zu bekommen ..."
- „.... Zunächst aus den Werten ihrer Erziehung heraus war es Martha sehr wichtig, ein gepflegtes Haus zu haben und den Kindern Geborgenheit zu bieten, doch mit ihrem Älterwerden merkte sie, daß ihr das nicht mehr reicht, sie orientierte sich mehr nach außen, wobei sie jedoch nicht egoistisch handelte, sondern nach Lösungen suchte, allerdings war sie nicht mehr völlig selbstlos ..."
- „.... Das Abwägen zwischen Familie und Beruf war für Martha ein langer Kampf. Einerseits wollte sie die Ausbildung, die sie genossen hatte, zum Einsatz bringen, andererseits merkte sie, daß sie das nicht völlig ausfüllte. Als sie dann schließlich ihren Mann traf, ließ sie ihr Gefühl sprechen und für einen gewissen Zeitraum wollte sie der Familie Vorrang geben, ohne darüber allerdings völlig ihre beruflichen Absichten aus den Augen zu verlieren ..."
- „Es ist unwahrscheinlich, daß Martha sich in diesem Alter schon so gut kennt, daß sie genau weiß, was sie will ..."
- „.... Freundschaften, die einen ein ganzes Leben, wenn auch manchmal aus der Ferne begleiten, haben eine andere Qualität als solche Beziehungen, die man erst später im Leben anknüpft ..."
- „.... Sie wird sich bestimmt an die Zeit der ersten jungen Liebe erinnern, die eigentlich, egal welche sonstigen Zustände herrschen, trotzdem immer eine sehr schöne Zeit ist, da vergißt man auch das, was um einen herum ist (Kontext Freundschaft versus historische Zustände, Freundschaft hat Priorität) ..."

- „… . Sie stellt vielleicht rückblickend fest, daß ihr die Berufstätigkeit zunächst sehr wichtig war und dann mit der Zeit immer mehr in den Hintergrund rückte hinter die Beziehung zu ihrem Mann und später den Kindern …“

3.4 Beispielsätze aus einem Idealprotokoll für die Dimension: „Relativierendes Denken“

- „… . also zu meiner Zeit gab es da nichts zu überlegen, da heiratete eine Frau und bekam Kinder und nur wenn sie keinen Mann bekam, war sie berufstätig. Doch heute ist das bestimmt, also für die Martha jetzt, mehr ein Konflikt zwischen Familie und Beruf …“
- „… . welche Ziele Martha verfolgt, hängt einmal bestimmt von ihrem Elternhaus ab, ob dort zum Beispiel Ausbildung ein Wert war, ob das gefördert wurde, es hängt auch davon ab, mit welchen Leuten Martha in der Jugend zusammen war …“
- „… . man kann sich eine Martha vorstellen, die ganz bewußt und wohlüberlegt die Entscheidung getroffen hat zu heiraten und Kinder zu bekommen, dann kann man sich aber auch eine Martha vorstellen, der zum Beispiel durch ein nicht gewolltes Kind ein Strich durch ihre Pläne gemacht wurde …“
- „… . es gibt viele Möglichkeiten wie Marthas Leben abgelaufen sein kann und wie sie heute dazu steht. Wenn sie zum Beispiel bewußt geheiratet hat und Kinder bekam, weil sie das als ihr Ziel ansah und darin ihre Stärken verwirklichen konnte, so wird sie zu einem positiven Urteil kommen. Wenn sie dagegen, um einmal ins andere Extrem zu gehen, es gibt wahrscheinlich viele Schattierungen dazwischen, später merkt, sie hat geheiratet, weil sie zu dem Zeitpunkt noch sehr stark von den Werten ihrer Eltern beeinflußt war, so wird sie das bereuen beziehungsweise versuchen, soweit es geht noch etwas an der Situation zu ändern …“

3.5 Beispielsätze aus einem Idealprotokoll für die Dimension: „Denken, das die Unsicherheiten im Leben berücksichtigt“

- „… . Martha hatte damals die Entscheidung für Ehe und Familie getroffen, obwohl sie sich nicht völlig sicher war, daß es das Richtige war, aber das weiß man eigentlich nie im Leben, da bleiben immer Fragezeichen, sie muß eben jetzt immer wieder überprüfen, ob sie noch zu ihrer Entscheidung stehen kann oder ob sie etwas ändern muß …“
- „… . wenn Martha auf ihr langes Leben zurückblickt, stellt sie fest, daß viel Unvorhergesehenes geschehen und viele ihrer Pläne durchkreuzt wurden, daß es aber oft nicht zum Schlechtesten gereichte, weil sie flexibel genug war, sich auf neue Wendungen einzustellen …“
- „… . Martha stellt rückblickend fest, daß man sich eigentlich auf nichts verlassen sollte, sondern immer damit rechnen, daß sich die Dinge verändern, also zum Beispiel, daß sich Gefühle in einer Beziehung verändern …“

- „... wenn man über das Leben zurückblickt, ist es natürlich leicht zu bewerten und zu verurteilen, weil man mehr weiß als zum damaligen Zeitpunkt, zu dem man trotz vieler Unsicherheiten eine Entscheidung treffen mußte ..."
- „... obwohl Martha und ihr Mann damals ihre Beziehung beide als die große Liebe empfanden und nicht mit einer Verschlechterung gerechnet hätten, lebten sie sich mit der Zeit auseinander. Plötzlich stellte Martha fest, daß sie sich nichts mehr zu sagen hatten. Zunächst war das so überraschend für sie, daß sie hilflos die Situation nicht wahrhaben wollte, doch sie lernte es mit der Zeit und auch durch die Hilfe einer Freundin akzeptieren. Wenn sie an diese Entwicklung zurückdenkt, wird ihr immer wieder deutlich, wie wenig man sich auf irgendetwas im Leben verlassen kann und darf ..."

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III. Andere Verlage

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